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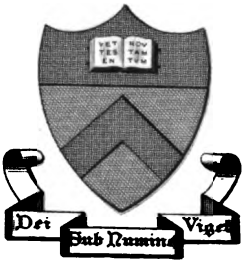

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VOLUME III

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PHILOLOGY OF THE CHINESE LANGUAGE.*

By JOHN FRYER.

The Chinese language undoubtedly forms one of the largest and most interesting of all the various fields for philological research. Its great antiquity; its unique and and primitive character; the unparalleled millions of people who have made use of it; its vast accumulation of words, resulting from milleniums of continuous growth; its independence of all foreign accessions; and its high literary development—all combine to make it one of the richest and most inviting subjects for the consideration of the philologist. It is an almost inexhaustible mine, only waiting to be explored, for facts that will tend to confirm or else to refute the generally received theories as to the origin and growth of all spoken and written language. No other language, ancient or modern, has successfully resisted the substitution of a phonetic system of marks or alphabet for the primitive ideographic or symbolic representation of ideas. The Egyptian hieroglyphics, although of equal antiquity with the Chinese characters, which they somewhat resemble, gradually gave way to phonetic signs or letters; but the Chinese pictorial representations have maintained their ground scarcely altered, up till the present

*Read before the Philological Association of the Pacific Coast, at the Mark Hopkins Institute of Art, San Francisco, December 29, 1899.

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time; so that inscriptions two thousand or more years old are still read without difficulty, and books written thirty centuries ago are daily quoted as good authority for the highest style. The isolation of the Chinese does not begin to account for this. The laconic and vigorous nature of their written language, appealing with most wonderful force both to the eye and to the ear, they are unwilling to exchange for the uncertain meaning of mere phonetic marks. Cumbersome as their characters appear to our eyes, and confusing as the jargon of so many similar monosyllabic sounds seems to our ears, the Chinese experience no serious difficulties in expressing in their own way the most elaborate and abstruse ideas they are able to conceive, as well as all the affairs of every-day life.

A consideration of the Chinese language naturally divides into two parts: (1) the Chinese considered as a separate language; and (2) considered in comparison with other languages. To begin to do justice to the various subdivisions of such a comprehensive subject would require a long series of papers, or a work in many volumes. The utmost that can be done within the space allowed for this paper will be to give the barest outline of the nature and construction of the Chinese language, adding here and there a point of comparison with other languages.

At the very outset we must endeavor to define what is generally meant by the Chinese language. When we are told that the spoken and the written languages of China are really different languages, it is difficult for us, who habitually speak much as we write, and write much as we speak, to conceive of the co-existence of two languages in a people, one used only in conversation, and the other only in writing. Yet such was the case in England from the Norman Conquest up to at least the middle of the fourteenth century, and such is the case in parts of Europe at this day, especially in Italy and Germany. Even among ourselves, the writings of Artemus Ward, Mark Twain, and other amusing attempts to imitate the sounds of the words,

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and the strange expressions of the rustic and uneducated classes in America, show very wide modifications of the English tongue from that spoken by the educated people or written by our best authors. Among the Chinese, however, not only are the spoken and written languages different, but there are many varieties of the spoken, and many styles of the written, so that we ought to call them collectively the Chinese *languages* rather than the Chinese *language*. Let us understand therefore, once and for all, that when people refer to the Chinese language they cannot mean one particular language, but the conglomeration of spoken and written languages, all possessing more or less of common ground or relationship. It may be compared with the whole of the European languages in connection with Latin and Greek. Hence to talk of the Chinese language is about as ambiguous as to speak of the language of Europe! In a general way Chinese may be divided into various forms of the living or spoken and of the dead or written languages used throughout the Empire, as well as in some of the neighboring countries.

Of the many forms of spoken language, that which is known as the Mandarin, or *Kuan-hua*, is the most generally used, being now with its various modifications, the official and polite language spoken over about four-fifths of the Empire and in some of the neigboring countries.

The dead or written language is of various forms or styles such as the Ancient Classic, the Modern Classic, the Official, the Documentary, the Commercial, the Epistolary, etc. This is collectively known as the *Wen-li*, or the classical scholarly language of China. It forms the language of books and correspondence which is used all over the Empire. It is also the learned or highest form of written language used in Japan and Corea. It has proved one of the most powerful means for keeping up the solidarity of the vast Chinese nation for so many centuries, being an indissoluble bond between people of so many widely different tongues and characteristics.

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The researches of several distinguished philologists have shown almost conclusively that there is a wonderful similarity between the sounds of many of the elementary Chinese words and those expressing the same ideas belonging to the languages of Western Asia and Europe;—thus pointing to a common Aryan source. Even in such a remote language as the English there are many instances of this similiarity of sound to the Chinese which can hardly all be considered as accidental. In Greek, Latin, Hebrew, Arabic, Persian, and Sanscrit the resemblances are, of course, still more numerous. It is worthy of note that among the ancient sounds of the Chinese characters there are far more of these resemblances than among the modern sounds; thus pointing to a more remote common origin. Of late years various sinologues have given what they consider reliable proofs of the Babylonian or Accadian origin of many of the sounds as well as of the characters of the Chinese language. Their inference is that the early Chinese came from some western region bringing their ancient language and civilization with them. Until this very plausible theory is fully demonstrated and accepted, it is well to reserve our judgment respecting it. The Chinese themselves have only a faint idea of the science of philology. From their "*shuo-wen*" we gather a few facts as well as speculations regarding the forms and sounds of some of the older characters. Some ingenious Chinese writers try to show that the sounds of many elementary Chinese words are imitations of those heard in nature. Thus many of the names of animals or the names of actions have sounds similar to those produced by the originals; and this is only what might be expected in a primitive language, which the Chinese most probably is.

With all their literary pride the Chinese can give no satisfactory account of the origin of their written language. They say that a Minister of the Emperor Hwangti, B.C. 2697, invented the existing system of forming the characters, of which 540 were then in common use. He looked

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up to heaven and observed the shape of the constellations, and down to the earth to examine the lines on the back of the tortoise, with the footprints of the birds; from these he obtained his system of characters to represent the commonest objects and ideas. There can be no doubt that the Chinese system of written characters was originally framed on similar principles to the Mexican, the Egyptian, and the Babylonian, only under a somewhat different form. The Chinese characters representing such familiar objects as the sun, moon, hills, man, horse, sheep, the eye, mouth, tree, carriage, bow, nail, etc., used to be more or less rude pictures of these objects; but in order to suit the use of the Chinese pen or brush all the curved lines are now made straight; yet the pictorial character is preserved.

"Necessity is the mother of invention." Having these simple outlines to represent visible objects, it became necessary to combine them in such a way as to express abstract ideas. The study of the process of word-building is especially fascinating because a large proportion of these compounded characters is still necessarily ideographic. These ancient word-builders often used the most crude and even grotesque ways to represent their conceptions of ideas. For instance: the original forms were multiplied, as by writing two trees side by side a forest was represented. Different original forms were combined, as by writing the sun and moon together to express brightness. Phonetic elements were added, of which there are now seven to eight hundred; all giving more or less clue to the sound of the characters to which they are united. Descriptive forms were invented; and so on. Some of these characters serve to illustrate in a very striking manner the Chinese conception of ideas. For instance: a man and a word mean sincerity, or the word of a man; a mouth and a dog mean to bark; a mouth inside a door means to inquire, while an ear inside a door means to listen; and so on. This is a species of etymology that cannot be found in any other existing language.

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The laws which govern the growth of other languages all apply more or less to the Chinese. Though essentially monosyllabic, yet certain characters are frequently used in combination. For instance, wood, or a tree, combines with material to mean timber, with a work-man to mean carpenter, with coal to mean charcoal, etc. These are as much compound words as the English woodman, woodwork, woodcut, etc. It is remarkable, however, that while in other languages such elementary words run together to form compound words, yet in Chinese no such union has ever taken place. The primitive syllables continue to be sounded and written separately as complete words; there is no agglutination whatever. But the Chinese language has grown from without as well as from within. Many words were derived from the aborigines; from the Buddhist missionaries, who introduced Sanscrit terms; from the Arabic, Persian, Manchu, and Mongolian intercourse, and in other ways. Recently the language has been greatly enriched by the introduction of Western terminology, so that characters of a phonetic or descriptive nature, either single, or more generally in combination, are now in common use in the native newspapers and current general literature, which were not even thought of a generation or two ago. Every year brings fresh accretions of this kind to the language. The national spirit of conservatism, however, shows itself in the unwillingness to give up a single character that has ever been in general use. Hence while new characters have continually been added none of the old ones have been absolutely dropped. The result is an enormous number of characters, estimated from forty thousand up to about two hundred and fifty thousand, although only about six thousand are in current use.

For purposes of classification in dictionaries and other lists of words the Chinese characters are arranged under two hundred and fourteen classifiers or radicals; all more or less ideographic. Most of the Chinese characters in present use are made up of two parts, the radical and

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the phonetic. From the pictorial radical a clue to the meaning is obtained, while from the conventional phonetic may be gathered a clue to the sound. Thus all the characters bearing the tree radical would be the names of trees, or articles made of wood, or ideas having some connection with trees or wood. This ingenious system of classifiers or radicals is similar in principle to that sometimes found in Egyptian hieroglyphics, and in the Assyrian cuneiform characters. For instance, the Egyptians used an oval line to surround the name of a king; the Assyrians used a perpendicular wedge-shaped form before a word to show that it was the name of a man. It is impossible to say which of the nations of high antiquity was the inventor of this system.

The number of separate sounds in the various dialects or spoken languages in China varies considerably. In the Mandarin dialect, as spoken in Peking and its vicinity, there are twenty-seven different vowel sounds, and twenty-two different consonant sounds. The combinations of these that are in use in Peking form only about four hundred and twenty different sounds, or monosyllables. With the large number of words in the language it is plain that some of these sounds must be made to serve for many words, varying from two or three up to several hundreds. Some difference in the tone or inflection of the voice used in pronouncing them is clearly the only plan to avoid perpetual confusion. The Pekingese have now only four of these tones or inflections of the voice, known as the "upper even," "lower even," "rising," and "departing" tones. These tones form one of the greatest difficulties in acquiring any of the spoken languages of China. The number of sounds and tones varies in different parts of the Empire. The Cantonese has twelve tones arranged in an upper, middle, and lower series. Other dialects have still more tones. The use of the aspirate is also of great importance, occurring as it often does in the middle of a syllable. It will be seen from the above statements that

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the context or association and the tone, form the means by which only four hundred to five hundred sounds can be made to do duty for the tens of thousands of words composing the Pekingese or any other of the languages of China. A scholar once wrote an essay of two thousand or more words each having the sound of "I" so that to read it, was merely to repeat "I" so many times, in the different tones that were necessary.

If to the above difficulties that exist in the Chinese language there were to be added a strict and rigid system of grammatical rules, inflections and changes, such as abound in some Western languages, the task of learning it might well be considered as almost hopeless. Fortunately, however, there is practically no grammar in Chinese. The words express root ideas without reference to parts of speech, and may generally be used as nouns, verbs, adjectives, or adverbs indiscriminately without any change whatever. Moods, tenses, voices, persons, gender, and number make no difference to the way in which a character is written, although the tone in which it is pronounced may sometimes be varied. Conjugations, declensions, regular, irregular, and auxiliary verbs, etc., are distinctions which have never yet entered the Chinese student's mind, or distressed his youthful brain. In the absence of inflections these various differences in meaning are either sufficiently shown by the context, by the relative positions of words in a sentence, or by the addition of other words. With such extraordinary advantages, is it any wonder that every Chinaman is a born orator? In the highest class of Chinese books or correspondence no kind of punctuation is attempted. It would not be polite to send a letter to a literary man with punctuation marks, for it would imply that he could not read without such assistance!

Numbers are usually expressed by the use of only thirteen characters with their combinations. These represent one to ten; after which come hundred, thousand, and ten thousand. Each of these characters has three forms in

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which it may be written, *viz.*, the ordinary, the complex, and the commercial. Some of the numerals, especially when written rapidly, are so much like our Arabic figures that there is a strong presumption that the Arabic system was borrowed from the Chinese either directly or through some of the intervening countries. The numerical system in in some respects resembles the Roman. It takes almost as many Chinese characters to represent a high number in the full form as it does letters to write in the Roman form. The Chinese ten is the Roman ten with its two strokes written, one vertical and one horizontal, instead of both oblique as in the Roman. There are characters representing a hundred-thousand, a million, ten millions, and a hundred millions, but these are very seldom used, high numbers being generally expressed as so many tens of thousands or myriads. Cardinal numbers are all changed to ordinal numbers in Chinese by the addition of the character "ti" before them, somewhat like our use of "th" after some of ours.

One peculiar feature of the Chinese language is the large number of words which have been called numerative adjuncts. We speak of a pane of glass, a length of rope or cloth, two head of cattle, a game of chess, three volumes of a book, etc. But we have only a few of such words, while the Chinese have a great many. In general every Chinese noun has its fixed numerative adjunct; as a handle of knife, two persons of men, three mouths of wells, four doors of cannon, four faces of drums, etc. These numerative adjuncts are of great assistance in conversation where so many different things are expressed by the same sound.

Although primarily consisting of but four or five hundred elementary forms, the many thousands of combinations of these forms give the Chinese, as far as the written language is concerned, a power of expression unknown in other languages. The simple and logical nature of its formation ought to render it a far more efficient medium for the communication of ideas, and as an instrument of

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thought than any of the languages of Europe. These Chinese characters have a double advantage. They present to the eye of the initiated the pictures of things, and the general terms derived from them. They also at the same time address the ear by the simple form of their phonetic construction. Thus the most complex notions and the most general expressions can be conveyed to the mind without disturbing the general unity which should exist in a sentence. The language of books and the language of conversation, though differing widely in the number and meaning of the words employed, are the same in their simple and logical construction and order. It is easy to see that this is a great advantage. Without any sort of inflection in its words, Chinese offers a wonderful exemplification of the power of syntactical arrangement to express the multitudinous variations of human thought. With a stock of only four or five thousand characters all thoroughly well known and understood, the literary man can read and write with accuracy, the myriads of combinations by which they may be made to represent almost every idea that the mind can conceive. The Chinese language affords scope for expansion in the most natural manner so as to express all the subtleties of Western thought. There have been Western students of the written language who have become so thoroughly fascinated with it as to believe it could easily be made the international or universal language, and take the position proposed for "Volapük." What now serves as a written medium for almost half of the people of the globe, speaking a great variety of dialects, they think could surely be made available for the other half! Its terseness and freedom from all grammatical inflection should certainly render its acquisition and use extremely easy by every nation. But on the other hand the idiom and syntactical arrangement of the characters to express the various shades of ideas would render considerable study necessary before freedom and accuracy in its use could be acquired sufficient for international purposes.

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The spoken languages of China may be divided into two groups:—Foreign languages and Native languages. Of the Foreign languages, the Indo-Chinese is the most important. Next comes the language spoken by the aborigines who are scattered about in tribes among the mountain fastnesses. Then come the Turkish, the Mongol, and the Manchurian. With the exception of these, the whole of the Chinese people speak languages or dialects which are entirely Chinese. These languages may be divided into four principal groups: (1) First comes the Mandarin or official language, called the "*Kuan-hua*," spoken by about four-fifths of the population and distinguished by three principal varieties:—the northern, the central, and the western. This language can all be written, and it has a literature of its own, but differs widely from the classical language and is, of course, considered greatly inferior to it. (2) The next in importance are what are called the "*Wu*" languages or dialects, of which the Ningpo, the Soochow, Shanghai, and Wenchow are the principal. (3) The "*Min*" dialects or languages, consisting chiefly of the Amoy, Foochow, and Swatow. (4) Lastly come the "*Kwang-tung*" dialects or languages, of which the Cantonese and the Hakka are the chief varieties. Each of these divisions has a large number of sub-dialects or *patois*. It often happens that in merely crossing a river or a hill one finds the language has materially changed; not only different sounds and different tones being used for the same word but often entirely different words to express the same idea.

Summarizing the ground we have gone over, we see that the Chinese is not one language but many; that the spoken language may either have been primitive or of Aryan origin; that the written language was originally pictorial or ideographic, like the Egyptian, and though since modified in various ways retains its pictorial and monosyllabic character; that it has grown from within and without, on the same principle as other languages, excepting that it has never allowed its words to combine or agglutinate, or

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become subject to grammatical inflections; that its radicals or classifiers resemble in use those of the Egyptian and Assyrian; that the small number of different sounds is compensated for by the use of peculiar tones or inflections of the voice; that there are certain advantages in the Chinese language which do not exist in any other; that its system of numerals, though primitive, is efficient, and in some points resembles the Arabic and Roman; that the spoken languages are divisible into four groups with numerous subdivisions; that the language is capable of indefinite expansion so as to express the various departments of Western learning without any serious difficulty, and that for some reasons it would well serve for international purposes.

In conclusion, I venture the opinion that the written language of China must necessarily last while the nation lasts. The teachings of Confucius and the other sages can be conveyed in no other words, and in no other form, than those in which they were originally written. The growth of thousands of years, which embodies the philosophical, the historical, and the political knowledge and life of the hundreds of millions in China, Japan, Corea, The Loochoo Islands, Manchuria, Mongolia, and Thibet is not likely to yield to a foreign tongue, but to last for many centuries to come. Even if China should come under foreign control this unique and wonderful language will have to remain unchanged, and will have to be learned by all who wish to carry on commercial or other intercourse to advantage with the inhabitants of the "Flowery Land."

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NEW PROBLEMS IN THE STUDY OF SOCIETY.*

By BERNARD MOSES.

It is not my purpose in discussing this topic to offer solutions, but simply to point out problems. My attitude for the time being is not that of a reformer, nor that of a moral critic; merely that of an inquirer about society and some of its unsettled questions. In this capacity one must hold society in a purely objective relation to himself; he must hold it as the biologist holds the subject-matter of his inquiries; he is concerned only with the nature and relations of the facts which it reveals. This position is not easily assumed, for most of our training leads us to examine society primarily with reference to its moral qualities and its moral achievements. This position, after it has been taken, is not readily appreciated by our friends. If one states a fact concerning society that seems to be shown by impartial observation, and that fact happens not to be in accord with the traditional judgment of the community, the impartial investigator has thereby forfeited some measure of the respect of his fellows. Society is at present not quite a free field for inquiry. Patriotism or provincialism limits our inquiries in the realm of society just as our traditional religious views limit our inquiries in the realm of the supernatural. Still, if one would give to his studies of society a scientific quality, he must assume

*An address before the Southern California Teachers' Association, December 22, 1899.

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the intellectual rather than the emotional attitude toward his material. If, after mature observation and research, you affirm that American society from the agricultural simplicity and equality of the colonial days has grown to be marked by wider extremes of condition, you run the risk of being charged with advocating aristocracy. We seem not to be quite far enough on in our cultivation to appreciate that one may state facts about society without involving his personal preferences.

It is in this spirit of impartial inquiry that social studies should be made. They should be made, moreover, in the thought that every age has problems peculiar to itself; and that when the problems of to-day are solved, to-morrow will bring a still larger group. With every decade society becomes more complex. There are consequently more points of possible friction, and, therefore, more adjustments needed in the interest of harmony and effective work. If society moved in cycles, as our ancestors believed, these new problems of adjustment would not appear. A series of old social problems would reappear at intervals throughout the centuries of human history. After one cycle had run its course there would be no new problems. Each phase of social life would be a reproduction of an earlier phase. History would repeat itself. But the life of society does not run in cycles. It runs on and on in an ever-changing environment, and with an ever-changing spirit. A position that is abandoned is abandoned forever. The problems which our ancestors solved will not be presented to us, and those which we solve will not demand the attention of our posterity; and this is true because human society is marked by progress and not by recurring cycles.

Every age is, therefore, an age of transition; but the several ages differ from one another as it regards the rapidity of social movement. In the life of the race there are decades, and sometimes centuries, when little progress is made, when year after year passes without modifying the

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ideas of society or adding greatly to its material equipment. These seem to be barren places in history. They are not, however, really barren; they are simply periods when the soil is lying fallow and preparing itself for a subsequent growth. In other periods the achievements of a few decades may transcend those of many previous centuries. A striking instance of remarkable growth after a long period of barrenness is observed in the development of means of communication and transportation. In this century more has been accomplished in this matter than was accomplished in all the previous centuries of human existence. It was as easy to travel a hundred miles in the time of Cæsar as in the time of Washington. It was as easy to transport freight in Italy in the early years of the Roman Empire as in America in the early years of the Republic. The mechanical equipment which the Western nations have acquired in this century is transforming the face of the earth, readjusting the relations between nations, and bringing forward most of the new social problems which this generation has to face.

Important among the new social problems are those that are presenting themselves in connection with the large cities. The most vital of these are such as arise from the fact that the population of the cities is increasing more rapidly than the population of the country. This condition of things is due largely to improvements in transportation that have been made in this century. When the transportation of food products was difficult there were many small markets. Except where there were opportunities for carriage by water, many small towns drew to themselves the products of a limited surrounding region. The value of most of these products was not sufficient to cover the expenses of carrying them a long distance by land. All the ordinary articles of food had to be consumed near the place of production. They were gathered in local markets, and in these markets they were very cheap when the harvests of the surrounding regions were plentiful; and

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they were dear when the crops of these limited regions failed. They were dear because of the expense of bringing heavy articles from distant points. But in fertile districts where crops seldom failed, prices were generally low; and the cost of living in the small towns or in the country was very little in comparison with the cost of living in the large cities.

The development of cheap and rapid transportation has changed all this. When it costs no more to carry corn and potatoes and beef two hundred miles than it formerly cost to carry them twenty miles, there arises a large market in place of the many small markets. The city becomes a great market, supplanting the many small markets, each within its limited district. Instead of being the place where food was dearest, the city has become the place where food is cheapest. It has become a great food market, a distributing point for a wide region, and consequently a market with a comparatively low and stable price. It costs less to procure food in San Francisco than in any of the surrounding towns; and this is typical of the relations existing between the city and the country town wherever the modern system of transportation has been developed. By this change the main hindrance to the growth of cities has been removed. Futhermore, by the development of systems of municipal transportation the habitable area of cities has been greatly extended. By this means also the rent of houses has been kept low, thus removing another great obstacle to living in cities.

At the same time that these economic obstacles have disappeared, the attractions of city life have been greatly increased. With the new means of lighting which modern inventions have furnished, all social amusements have acquired a new attractive power. The gorgeous and brilliantly lighted saloon is a much more agreeable place than the store of the country town, dimly lighted with tallow candles or a malodorous lamp. The theatre, with its beautiful scenery, its brilliant costumes, and its spirit

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of fun and jollity makes a strong appeal to the uncritical part of the inhabitants. The public library, with its accumulated literary treasures, puts into the hands of the ordinary man in the city what the wealth of kings could not have purchased three centuries ago. And the municipal museum, with its store of pictures and statues, makes the dweller in the city the heir of all the artistic ages.

It is under influences proceeding from these sources that the modern city has outgrown the country; and in the course of this growth it has presented certain new social problems. The first of these problems concerns the government. When the foundations of our government were laid, the city was an unimportant factor; and the founders had in mind a sparse country population and the inhabitants of small towns. To-day cities dominate the country, and the small town is putting on the airs of the city. The conditions of the present were not contemplated in planning our political structure. The striking inequalities of wealth which exist in our great cities were unknown. Neither the very rich, nor the great multitude of dependent workers had appeared in that Arcadian society. Democracy became our ideal, and it was very nearly realized in the local government of the township. The ideal was suited to the conditions; it was, in fact, a product of the conditions then existing. But the conditions have changed, and the problem before the coming generation, the new problem, is to determine how to preserve the spirit and virtue of democracy, and, at the same time, to create and operate a government that shall bring to the great city peace and prosperity and a harmonious development, in spite of the clashing interests, the rankling jealousies, the snobbish arrogance of the rich, and the reckless resentment of the poor.

In another view the great city presents a problem more far-reaching and, perhaps, more difficult of solution than the problem of government. I refer to the problem of so ordering the conditions of city life that the tendency of

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permanent residence in the city will be towards a continuous improvement in the family stock rather than towards its deterioration. At present it is an ascertained and acknowledged fact that after three or four generations of continuous residence in a great city families show distinct characteristics of degeneracy. As a consequence of this, the great centers of population are able to maintain a high standard of morality and intellectual prestige only by drawing a new supply of inhabitants from conditions more favorable to the development and maintenance of a sound physical and mental constitution. The continuous progress of the city depends on the possibility of continuous drafts of the best from the country. Undoubtedly the circumstances of city life act as a tonic on those who are strong, and who come with trained powers. The city stimulates, but it does not create; it excites, but it consumes. The latent powers that might have remained forever unexpressed under the circumstances of the village or the country are unfolded in the stimulating atmosphere of the city, and here make their contribution to the higher phases of social development. But they are wasted in the process. The strong are, however, not the only ones consumed. The weak in the city are like the moth at the lamp. They flutter in the light for a moment, but are ultimately burned. The result of their living is the pleasurable excitement of their individual experience, and a multitude of kindly offices performed within the limits of narrow lives.

If the city is outgrowing the country, it follows that it is constantly demanding more strong recruits from the country while there are relatively fewer to be had. If, moreover, the circumstances of the city, in the long run, make for deterioration and degeneracy, it is clear that our so-called highest forms of society have in them the seeds of death; and that the relative depletion of the country, or the failure of the population of the country to grow as fast as the population of the city, indicates a cause and the process of decay. It might be rash to affirm that here is

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the sickness of which nations die; yet it is difficult to refuse to acknowledge the force of this suggestion when we recall the fact that the decline of Roman society was preceded by a gradual withdrawal of the free men from the country to the cities; or when we observe that the Oriental empires of western Asia seem to have lacked stability by reason of a marked concentration of the inhabitants in the great cities. And one of the symptoms of Spain's disease is that her fields are deserted, and that there is no adequate country population from which the cities can be recruited.

The social problem which appears from this point of view is to discover how the fires that consume the generations of the great city may be extinguished, or how the country may be made to produce more men to be consumed in the cities, that our brilliant civilization may be kept aflame.

It is not merely the gathering of the population into great cities, but also the gathering of the wealth into comparatively few hands that has given rise to new social problems. The drawing together of capital, like the drawing together of persons, has one of its causes in mechanical invention; for progress in the mechanical arts has made it possible and profitable to carry on industry and commerce on a very large scale. Individual owners of capital have not been willing or able to venture in a single undertaking all the capital that was necessary to make the business the most profitable possible. Combinations of capitalists have, therefore, been found to be an economic necessity. The force that has brought about this primary combination, organized as a corporation, has brought about the secondary combination, or union of corporations, organized as a trust. The trust may be obliged to assume the organization of a corporation, but this will not interfere with the attainment of its original purpose. The corporation has come into existence to satisfy the universal desire underlying economic activity, namely, the desire for gain; and it has come at a time when it was clearly seen that by operations on a large

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scale this gain could be more surely and more rapidly acquired than by the ancient method of individual industry and commerce.

Machinery exists because it saves labor, and thus reduces the cost of production. Large combinations of capital exist because, with a given amount of capital employed in this form, a larger product may be had than by causing the capital to be distributed among many individual enterprises. The corporation, or the trust, is a capital-saving device as machinery is a labor-saving device. Because of the economies of production on a large scale, it becomes possible to furnish wares to consumers at a lower price under the corporate organization of industry than by any other means. And on account of this fact, the corporation appears to have as legitimate a place in the economic organization as the locomotive or the power-loom. The problem of the corporations and trusts is, therefore, not to discover how they may be abolished, but how, as artificial persons, they may be made to occupy their legitimate place in society; or, in other words, how they may be made to obey the law in the same manner as the individual person, and thus become beneficent agencies of social progress.

But the mere statement of this problem raises others. One of these concerns the ability of a popular government to control corporations, in view of the fact that the bulk of the citizens who determine the policy of the government are interested in having the corporations uncontrolled. In this phase the problem of trusts, or corporations, appears to be a political and not an economical problem. When the popular government of America was established, only the individual person was prominently in view; and hitherto the government has found no difficulty in subduing this kind of a person, however obstinate and refractory he may have appeared. But with the artificial, corporate person it has not been so successful. The problem, therefore, at this point is how to increase the administrative power of the government and the will of the government to such an

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extent that it may be able to hold, and wish to hold, all corporate persons in steady control, without laying aside that just leniency towards the individual, which is necessary to the maintenance and development of liberty.

The strong drift towards the corporate control of industry and commerce provokes inquiry concerning the fate of the individual man under this movement. Every step in the aggregation of capital and the centralization of control, brings a larger percentage of the population into positions of dependence. There was, probably, never a period before this when relatively so many of the citizens of this country were engaged in carrying out plans originated by others. The stipend or wages class is larger to-day in this country than ever before. The petty shop-keeper has become an employee in a department store; the manufacturer on a small scale has been absorbed by the trust. In every line of business the few are taking the initiative and making the plans, and the many are executing these plans. The social problem which arises here concerns the effect of this increasing dependence on the welfare of the individual citizens, and on the prospects of the republic.

As it regards the welfare of the individual, the problem presents the alternatives of an assured salary and a subordinate position, on the one hand, and an uncertain income and the position of an independent proprietor, on the other hand. There is here raised an inquiry concerning the freedom of the salaried employee from the worrying calculations and responsibilities of the small proprietor. This freedom is balanced against the endless cares of the petty shop-keeper or manufacturer, who has to face the fact that ninety-five per cent. of his class fail. Some account must also be made of the opportunity which the employee enjoys of having a partial view at least of whatever lies within the horizon of the corporation with which he is engaged. By this means he is brought to entertain larger ideas than those which come to the mind of the small proprietor, whose business makes exacting demands of

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time and attention, and thus tends to make the horizon of his thought as narrow as the field of his enterprise. In this problem there is involved, moreover, a consideration of the modification of the institutions of the Republic that may come as a consequence of an increasing number of citizens falling into positions of economic dependence. When the bulk of the citizens occupy such positions, we have clearly departed from the original conditions of the free and independent life which characterized the beginnings of the nation. This division of the population into a large number of employees and a relatively small number of employers establishes a new relation between the society and the government. If the employing and the employed classes work in harmony, the employees will be moved by their sympathies to follow more or less closely the known political wishes of their employers. If, on the other hand, these two classes are not in sympathy with one another, the antagonism between them will necessarily have a certain political effect, and will cause to appear some of the characteristics of a house divided against itself. In either case there is a departure from the original independence of the citizens and the anticipated conditions of suffrage.

In connection with the problems raised by the observed increasing economic dependence of the citizens of this country, there appears another question even more important. I refer to the question of the ability of all independent persons to retain their independence under the clash of the forces that free competition has brought into play. In spite of the prominence given to the idea of equality during the last century and half, no fact is more evident than that men are not equal, either with respect to their intellectual powers, or with respect to the dignity and worth of their moral purposes. The law may seek to deal impartially with all under its authority, yet the fact remains that these persons are the possessors of widely different powers; and it is evident that men with different abilities placed under circumstances affording common opportunities will derive

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unequal advantages from those opportunities. In this is seen the first step towards practical inequality. Here is revealed the first movement towards the widely diverging conditions of men; and as long as freedom of action is maintained, and men continue to be endowed with uneqnal powers their conditions will continue to diverge. Freedom of inheritance and free competition accentuate the misfortunes of the weak, and promote the advantages of the strong. The handicap of the hindmost becomes relatively heavier with each succeeding generation; until, by the very force of unequal abilities operating under freedom, the weak are driven so far towards the wall, that we are forced to inquire whether under the relentless competition of thorough freedom they may be able to maintain themselves.

This is a new problem. It is a problem of the later centuries, and particularly of this century; for in no other period has the individual man appeared with so little extraneous support. In previous ages he was hedged about with customs and traditions and laws. Under the customs and laws of feudalism no man stood alone. All were bound together by a system of mutual obligations. The vassal served his superior, and the superior was under obligations to protect the vassal. The relations among the different members of society were not determined by a freely formed contract, but by customs and rules which the members most vitally affected had small hand in making. And when feudalism as a form of social organization was set aside, much of the spirit of feudalism survived. Laborers, although nominally free, continued to hold a personal relation to their employers, and the employers recognized that their superior position carried with it certain moral obligations. But in the characteristic society of the present, with its impersonal employers and its warlike laborers, the ancient customs and traditions have fallen away, and the several members stand forth, without hereditary claims for protection or hereditary obligations of service, in the nakedness of their individual power or weakness.

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This problem, stated in a few words, is, can the free man remain free? In a society which seeks to realize the complete individuality of its members, and is moved by the merciless forces of competition, will it be possible for our ancient ideal of personal independence to be maintained? Will the conditions here existing, in the course of time, through the differentiation of the strong and prudent from the weak and imprudent, tend to produce some form of superiority and inferiority? It may be doing violence to our traditional thought as Americans to raise this question; yet the natural differentiation of society in the process of growth, the present struggle between the employers and employed for domination, and the willingness of crowds of laborers to believe they are being oppressed by their employers constitute a sufficient ground for the assertion that such a question exists. This question is, moreover, warranted by the fact that every society whose historical progress we can trace has produced a class that has pretended to superiority, and another class that has been obliged to acknowledge its practical inferiority. The problem, then, is to determine whether under the forces existing in our society the practical position of the individual man will remain as independent as we have been accustomed to think ourselves, or whether some new form, or system, of mutual obligations must arise to prevent the weak and ineffective from being overridden and cast out as a rejected mass of human rubbish.

This has not long seemed to be a serious problem; for we have been accustomed to think of law as a powerful transforming agent, sufficient to cause to appear in practice the condition at which it aims. If the law affirmed the equality of all men, it has been presumed that they would be so in fact. If the law affirmed that men had a right to occupy a certain position in the affairs of a community, it was taken for granted that they would occupy that position. In this there has been simply an over-estimation of the reformatory, or creative, power of law. But we are

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beginning to learn that law has comparatively little power to make new conditions. Mexico established and has maintained a constitution which organizes a liberal federal republic after the model of the federal republic of the United States. Yet this law did not transform the conditions of that country so that a federal republic would be the normal expression of its political spirit. The Mexican government is not what it is by the force of this law. On the contrary, forces in the society which the law has thus far been powerless to modify have determined the character of the government. The law stands, but the spirit of the law is ignored; and the more or less benevolent despotism that has grown up in that country, to pacify and to bless the nation, is not the product of a constitutional law borrowed from the United States. The law provides for a federal republic, but the real character of the government is what it is made by other forces than the law.

Furthermore, after the civil war, we attempted, by a simple legal enactment, to make several millions of recently emancipated slaves independent and effective citizens of an enlightened republic. We seemed to believe that men in massess could be lifted from barbarism to civilization by a simple declaration of the law. After centuries of absolute dependence, with no traditions of responsibility, with no training in the business of government, it was proposed to thrust them into positions where they would be charged directly with the highest interests of humanity. The law was to work the miracle. But the miracle has not been wrought. Those members of the society whose antecedents were those of civilization have been constrained to attempt to uphold the achievements of their ancestors; and in the emergencies of the situation they have often demanded that the law should be silent. They have met the crimes of barbarism with a method and a punishment that might be supposed to impress and deter the barbarian.

As it regards the problems of the Southern States that

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have arisen from the presence of two distinct and antagonistic races, they are not much nearer a solution than they would have been if no attempt had been made by law to determine the relations between these races. The conspicuous events in the social affairs of that part of the country are phases of a struggle through which society is seeking the solution of a very grave problem. The unrest and the barbarities that mark life in that region are evidence that the solution attempted by legislation has not been found satisfactory as a final determination of the race problem. But it does not yet appear what the conclusion will be. After thirty years of freedom, the black race has not won the confidence of the white men, and the white men have acquired a new form of antagonism. It is clear, therefore, that the problem which we have expected would solve itself under a legal enactment, has made little progress in that direction. Instead of this, the question of the white man's relation to the negro in the South is merging itself into a new phase of the larger unsettled question of the relation of the white man to all other men of whatever color. This is one of the serious inquiries of the present age. It concerns the relation which the white man is destined to hold to other races. By the outward movement of the English, this question has become especially conspicuous, and it is raised wherever Europeans have established themselves beyond the borders of Europe. But where only a sparse and savage population has been encountered, its more serious aspects have not appeared. Here the solution has been simple; the aborigines have been swept away. But the outward movement of the English people has not ceased when all lands with a sparse population have been appropriated. Regions with many millions of inhabitants have been overrun, and here the new problem arises. Here the inhabitants are not savages, nor are they few in number, nor can they be exterminated. They are destined to live, and the white race is destined to live with them. And because this is true, we are bound to inquire what

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must be the relations between these two elements, in order that their coöperation may most surely promote the highest interests of humanity.

Before the English settlers in America and Australia, the inferior race disappeared; it was doomed by the fact that the English had no mind for amalgamation, and the aborigines could not rise to the English standard. But in India and the Philippine Islands the original inhabitants will remain and continue to multiply, thus raising the new problem and making it imperatively necessary to find some basis on which the two races may advantageously live together. This is not a theoretical problem simply, but a problem of vast practical import; and its importance is likely to increase in view of the fact that the white race, in its later expansion, must move upon densely populated territory. There are no more sparsely settled continents to be discovered; at the same time it is not to be expected that, after a thousand years of marvellous expansion, the Anglo-Saxon people is suddenly to lay aside its habits, and manifest no longer a disposition to run over its borders. A people, like an individual man, that has grown to maturity, and developed strong instincts under a certain line of conduct, is not likely to lose these instincts, or to lay aside its hereditary impulse, in view of the possibility of giving a wider range to its normal activity.

The solutions that are offered by the experience of other times are not applicable. The previously executed English plan of sweeping away the aborigines cannot be carried out here. The Spanish plan of mingling the blood of the white and the colored races encounters grave objections: it is not agreeable to the English mind; it causes the higher civilization to be lost in a lower; and it produces a mongrel people that is able to reach the white man's estate only after centuries of painful effort. The plan carried out in the Oriental rule of provinces may not be followed, because it violates our worthiest political traditions, and defeats our highest social purposes. If some of the data of this

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problem have appeared earlier, the problem itself is, nevertheless, new, because our new ideals lead us to demand a new result.

These are a few of the problems the present generation has to face. They are fundamental in the study of contemporary society, and important as involving our social policy. When they shall have been solved, others more numerous and more difficult will arise, and thus onward till man gives up the attempt to remain civilized. The task of civilization is an ever-increasing labor. A nation may be proud of its past and satisfied with its present, and retire before this growing undertaking. This is the beginning of national decay. The only hopeful alternative is found in the earnest and vigorous devotion of mind and heart to the business of our common life.

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THE LIVING PLANT IN NATURE STUDY.*

By W. J. V. Osterhout.

It seems to be generally admitted that plants are especially suitable objects for nature study but it is to be regretted that too often the attention is centered on the dead plant to the exclusion of the living one. This is a mistake and will be recognized as such if the aims of nature study are not lost sight of. These are, first, to put the child in the right attitude, to awaken his sympathetic interest in plant-life and, second, to develop his observing and reasoning powers in leading him to find out for himself what the plant is doing and why it does it. Both these objects may be admirably attained by experiments performed by the children themselves on living plants.

Experiments should not be performed in a haphazard manner, nor—as usually happens—to demonstrate something the child has already accepted as a fact; but to answer questions which have been previously put by the child himself or by the teacher. I believe this point to be of fundamental importance, although generally overlooked. Experiments seem to be usually regarded as useful for demonstrative purposes only. I do not believe that, for nature study at least, this is the best use to which they can be put. The child can use experiments for the same purpose as the investigator uses them, *i.e.*, for putting questions to nature, and will find in this a mental

*Address delivered before the California Teachers' Association at Sacramento, December 29. 1899. Illustrated by drawings from nature by Mr. A. A. Lawson.

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quickening and zest such as comes in no other way. Children are investigators, in their own way, and enjoy experiments of all kinds, especially experiments with things which are alive.

An enthusiastic and sympathetic teacher will easily get the children to ask questions; the next step is to show them how to answer their own questions by experiments, or, better still, lead them to suggest for themselves how to do this. Herein lies the value of the method. It leads the child to think; reveals to him his own power to find out things and creates an interest which does not die when he leaves the schoolroom. He gains, almost without conscious effort, an insight into plant-life which makes plants attractive and interesting wherever he sees them and which will surely entice him into the fields. He comes to see the plant in a new and wonderfully inspiring way, as a living, struggling being, attacking its competitors, warding off its foes, adapting itself by clever devices to harsh and unfavorable surroundings; in short, solving the thousand and one problems of its existence with consummate skill. And what he before passed over with apathy he will learn to observe, admire, and study; in some measure he will come to see the beauty and learn the lessons of common things.

Many teachers may approve of experiments, but shrink from what they suppose requires too much time and the use of complicated apparatus. I wish to point out that the most interesting and instructive experiments can be performed either with no apparatus at all or with such as the children can easily make for themselves and that the outlay of time and money are exceedingly small while the returns are of great and lasting value.

The experiments here described require no special skill and almost no apparatus. The few articles required will also serve for many other experiments. The necessary plants can all be grown on a single shelf in front of a convenient window. In this brief space I can mention only a few experiments, merely enough to give an idea of

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the method. But it is the method upon which I desire to lay stress, since experiments are often performed in such a way as to be a source of confusion rather than of inspiration.

We shall do well to begin where the independent life of the plant begins, with the seed. Plants should be used which are familiar to everyone and which are easily grown and cared for. Some Scarlet Runner Beans may be soaked over night and given the children to examine, together with unsoaked seeds for comparison. How does soaking affect the covering of the seed? Do all seed-coverings* behave in this way? Try some hard, resistant ones, such as the Castor Bean, Buckeye, Acorn, and Peach or Cherry pits. Of what use is the seed-covering? Does it help the taking up of water? A simple way to answer this is to remove it before soaking and note the result as shown by the general appearance of the seed. Acorns are good for this purpose as the shells are easily removed and the seed is usually more or less shrunken and becomes plumper on taking up water so that the effect can be easily noted. How does the water get through the seed-covering? Select some well soaked Scarlet Runner Beans. Wipe them perfectly dry on the surface. Now squeeze the seed. Does water ooze out? Where? Does this hole in the seed-covering allow water to enter? Can you find it in other seeds? Can water get into the seed except through this hole? Take some unsoaked seeds. Fasten them in a piece of split cork so that when it floats in the water the seeds will be half submerged. Let the hole in the seed-covering be well above the water and take care to keep it perfectly dry. If the seed takes up water in this position it must be through the seed-covering itself. It is interesting to use seeds with hard coverings for this experiment and to fasten some in the reverse position, with the hole under water, as a control-experiment.

Within the seed-covering is a tiny, sleeping plant.

*The term seed-covering is here used to include both seed-coats proper and other coverings from whatever source derived.

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Notice its tiny leaves, radicle and seed-leaves (Fig. 1).

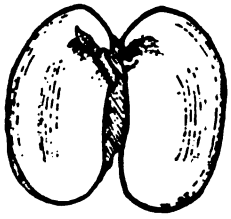

Fig. 1.

When does it waken? What is necessary to make it germinate and grow? Place some soaked seeds in damp sawdust and keep one lot on ice and another in a warm place. Place some unsoaked seeds in dry sawdust and keep others immersed in water which has been boiled for the purpose of expelling the air and then allowed to cool. On the top of the water a film of oil may be placed to prevent absorption of air. Which lot of seeds germinates? What prevents the others from doing so? Water, air, and a certain amount of heat are necessary to awaken a plant from its sleep. How long will plants keep alive waiting for a chance to germinate? Do some seeds respond more quickly than others when the right time comes? Is this an advantage to them? When a plot is sown for a lawn, what plants come up first, the grass or the weeds? Are weeds apt to be quick starters? Does this help to explain their success in crowding out other plants? We should remember that there is a constant struggle going on among plants for light, because if a plant be shaded too much it cannot live. The plants also crowd each other and struggle for room both above ground and below, where the interlacing roots are eagerly competing for the nourishment in the soil.

When the awakened seed starts to grow, it must first get out of its imprisoning seed-covering. When the covering is tough and hard, it requires considerable exertion to get out. Notice how the seed swells. Does it exert much force on the seed-covering in swelling? We can gain some idea of this if we put as many seeds as we can into a thick-walled bottle and immerse it in water over night. When morning comes the bottle will be found in fragments. Occasionally a ship, laden with rice or grain, founders or runs aground where the waves break over her, and the swelling seeds burst her in pieces just as they do the bottle.

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In the Scarlet Runner where do we find the first rupture of the seed-covering? Is there any reason for its occurrence in this particular spot? Remember that the radicle and the hole in the seed-covering are both found here. Is this so in all seeds? Is it any advantage to the radicle to double itself up as in Fig. 2A? Why? Notice how it behaves as soon as it is free (Fig. 2B). What part of the seed grows most rapidly? Do the seed-leaves grow at all? What has split the seed-covering across in Fig. 2B?

FIG. 2A.

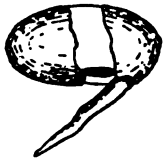

FIG. 2B.

Notice how hard are the coverings the little plant must break through in the Buckeye, the Peach, and the Cocoanut. Would it not be a great advantage if the covering were made softer or less resistant at the spot where the plant must break through? Can you discover anything of this kind? The "eyes" of the cocoanut are softer places in the shell; the peach stone splits easily along the edges. Peach stones take so long to germinate that we will study the squash instead. Notice where the seed splits (Fig. 3); notice also a peculiarity of the squash, a small projection known as the "peg" which grows out just at the right place on the stem. Can you see of what use this peg is? To watch a squash wriggling out of its shell reminds one of the way a man pulls off his boots and the peg corresponds to the man's toe when he makes it serve as a bootjack (Figs. 3 and 4).

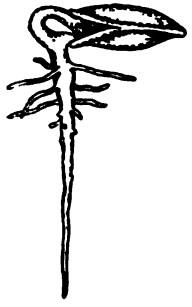

FIG. 3.

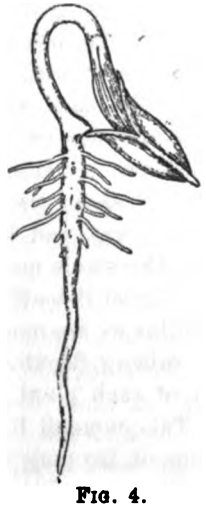

FIG. 4.

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As soon as the plant is fairly out of the seed-covering, the root begins to bore its way downward into the soil. Have you ever noticed what a hard time the roots have in getting into the ground when the seed happens to lie on the surface? Put some seeds on the surface of moist soil and cover them with a funnel (with a little cotton-wool in the neck to retain the moisture and admit air) or with an inverted wide-mouthed bottle, or, better still, with a bell jar. At first when the root starts to bore downward into the soil it only succeeds, in many cases, in lifting the seed up from the earth. How does the plant overcome this difficulty? If you look closely you can see a host of tiny thread-like hairs growing out from the radicle and anchoring the plant to the soil, thus enabling it to penetrate into it.

Have you ever thought of the difficulties plants have when the seeds are buried deeply underground and on awakening and bursting their seed-coverings they find a load of earth which must be struggled through or pushed aside before they can reach the light? Should you think this would be a serious obstacle to overcome? Plant some Scarlet Runner Beans in three different pots, one, two, and three inches deep respectively, packing down the earth well above them. Thrust a smooth flat piece of wood into the soil beside each lot and write on it with a soft lead pencil the date of planting. Note the date on which the first plants of each lot appear above the ground. The plants which are deepest in the soil may never come up at all; or if they do, they may creep up along the sides of the pot where the earth has shrunk away and left a crack. Or sometimes they will lift up the whole mass of earth above in a round, solid cake and thrust it bodily out of the pot. After witnessing a feat like this we are more ready to believe in the tales of mushrooms raising flagstones and the like. We may test the strength of each plant individually by a very simple contrivance. Take a small light glass funnel, (if this proves too heavy one of tin may be used) close the end with a cork and thrust the neck through the bottom of

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a small pasteboard or paper box. This should be placed over the plant as it emerges from the ground and shot may be poured into the box until the plant is barely able to raise the load.

Notice how much more easily some plants come up through the ground than others; the Corn-plant, for instance,

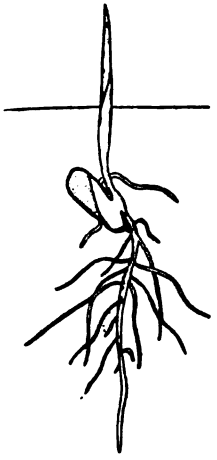

FIG. 5.

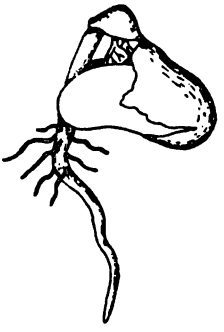

FIG. 6.

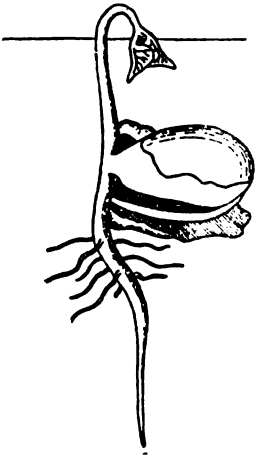

FIG. 7.

(Fig. 5) rolls its leaves up into a sharp, slender awl which seems to pierce the soil with ease. But the Scarlet Runner (Figs. 6 and 7) is very clumsy on account of the crook in the stem and must lift a much greater load. Sometimes it pushes up great lumps of soil when it comes to the surface. What is the use of this crook in the stem? Let us look also at the common Bean and at the Castor Bean (Fig. 8) which does not get out without a struggle which reminds us of an athlete straining every muscle. Can you tell why the Castor Bean has so much trouble?

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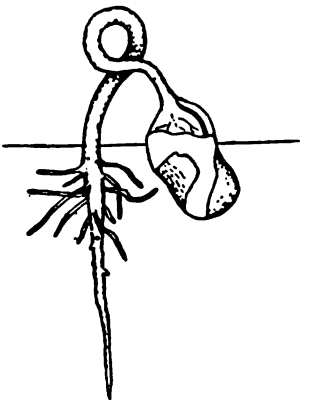

FIG. 8.

Let us now notice what the plant does when it gets above ground. The Scarlet Runner straightens out the crook in its stem and points its tip straight upwards. Soon the new leaves grow larger and we see clearly that they are not at all like the seed-leaves. Notice all the differences that you can. Here are some of them:—Seed-leaves: under ground; pale yellow; small and thick; shrivel and grow smaller for some time, eventually fall off. Foliage-leaves: above ground; bright green; large and thin; increase in size for some time, remain on the plant.

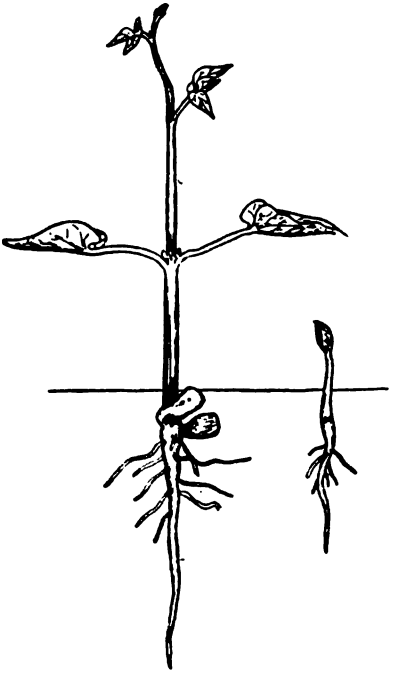

FIG. 9.

What is the reason for all these differences? Of what use are the seed-leaves? Perhaps the simplest way to answer this is to cut them off and see how the plant gets along without them. Select several plants (about an inch high) growing in a pot. Remove the seed-leaves from one-half the number and tie pieces of white twine to the uninjured plants and red twine to the others to

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distinguish them. In a few days you will see a difference; later on this will be much more marked (see Fig. 9). It would seem that the loss of the seed-leaves stops the growth of the plant. Why is this so? We see that the longer the seed-leaves remain on the plant the more they shrivel; *i.e.*, the more substance they lose. We cannot help thinking that the plant is taking this substance from the seed-leaves, especially when we find that the principal substance in the seed-leaves is starch, a very important food-substance for plants. How do we know this substance is starch? By means of a very simple test which you may try for yourselves. Break a seed-leaf in two and put a drop of iodine solution on the broken surface; if it turns dark blue (or black) it shows that starch is present. Test a little commercial starch in the same way. This test is so simple and certain that we can use it whenever we wish to know if any part of the plant contains starch.

I think we now know the use of the seed-leaves. What is the use of the foliage-leaves? Do they also contain starch? Let us test them as follows: Let the plants stand in as strong light as possible during the day; toward sundown remove some of the largest leaves, boil them (in order to kill them and swell the starch) and put them in alcohol over night. In the morning they will appear bleached, as the alcohol has extracted the green color. Dissolve in water some crystals of potassium iodide and add a few flakes of solid iodine to the solution. Place the leaves in the solution and if they do not turn dark at once leave them for some hours.

How do the foliage-leaves get their starch? Do they get it from the supply in the seed-leaves or do they make it themselves? Let us see if we can answer this question. Keep a plant in darkness two or three days; test the leaves for starch. If none is found, remove several leaves from the plant, putting one-half the number in darkness for a day or two and the rest where they will get as much light as possible. The leaves must be placed in water; be sure

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that the stalks dip well beneath the surface. After a day or so test the leaves which have been in the light. The starch which we now find in the leaves must have been made by them *after they were removed from the plant*. Now test the leaves which have been kept in darkness all the time. Why is there no starch in them? Is it because they have been kept in darkness? We may put this to a final test in a very simple way. Fasten corks to opposite sides of a leaf, (as shown in Fig. 10) so as completely to exclude

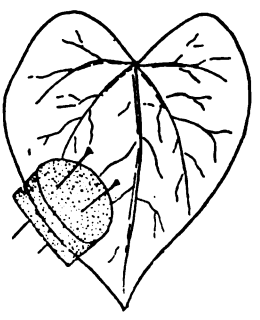

FIG. 10.

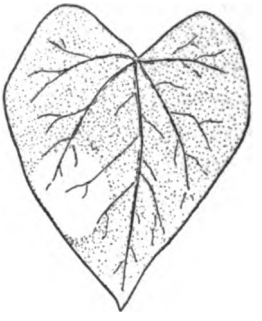

FIG. 11.

the light from the covered portion. The leaf must not be removed from the plant and should be placed where it will get plenty of light. In a day or so test it for starch; this is found everywhere except in the covered portion (Fig. 11.) It would seem that lack of light alone has prevented this part of the leaf from making starch. Foliage leaves, then, have the power of making starch; but they must have light in order to do so.

Now what is the use of this starch in the foliage-leaves? Is it absorbed by the plant like the starch in the seed-leaves? If so, ought we not to find less starch in the leaves in the morning than at night, since the making of starch stops at sundown and what is taken away during the night cannot be replaced until the next day? Test some leaves at sundown or a little before; now place the plant in a dark box or cupboard, and in the morning test again. We find the starch

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has almost or quite disappeared. Would it have done so if the leaves had not been on the plant? Take some leaves which contain plenty of starch; remove them from the plant and put them in a dark box or cupboard. The stalks should dip well under water. In a day or so test them for starch. They have not lost any. It seems then that *foliage leaves produce starch and the plant absorbs it from them.*

It is now time to see whether we can answer the question asked a little while ago, Why are the foliage-leaves and seed-leaves so different? You can see that it is of advantage to the plant to have the foliage-leaves remain as long as possible on the plant. You can also see why they should have as large a surface as they can, since the more light they catch the more starch they can make. You can see, too, why the seed-leaves need to be thick and bulky so as to store up a great deal of starch. Perhaps you do not see why the foliage-leaves are green and the seed-leaves pale yellow. You will understand this if you put a few seeds into a pot containing soil or sawdust and keep it entirely in the dark until the plants are several inches high. The plants grow very tall and slender and the leaves are small and yellow, in color resembling the seed-leaves. Put the plants in the light for a day or so. Test them for starch. None is found. Leave them in the light until they turn green. Then test for starch. Does the result indicate that the green substance is necessary for making starch? It is this substance, called chlorophyll, which is extracted by the alcohol when you test the leaves for starch. Usually it is not formed in darkness. Do you now see why the seed-leaves are not green? Remove some of the earth so as to expose them to the light. Do they turn green?

The seed-leaves and foliage-leaves are different because they have different tasks to perform and their structure must be adapted to the special kind of work they have to do. We may sum this up by saying, *function determines structure*. When we see how different the seed-leaves of

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the Castor Bean are from those of the Scarlet Runner, for example, we at once suspect that their tasks must be quite different. Notice how thin and delicate are the seed-leaves of the Castor Bean (Fig. 12). Where is the food stored in the Castor Bean? Not in the seed-leaves but around them, and their task is merely to absorb it. See how closely they are attached to the substance they are absorbing. Cut away the food substance carefully, so as not to injure the seed-leaves. Does this check the growth of the plant? After the seed-leaves get above ground they are called upon to do still another kind of work. What is it? Do they change their appearance correspondingly? (See Fig. 13). Do you know any other seed-leaves which are absorbing organs instead of storehouses—any which are both? (See Fig. 5.) Do you know any other seed-leaves which come above ground and help to make starch?

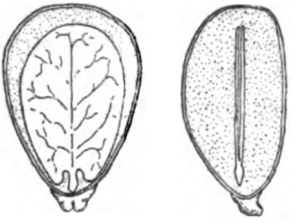

Fig. 12.

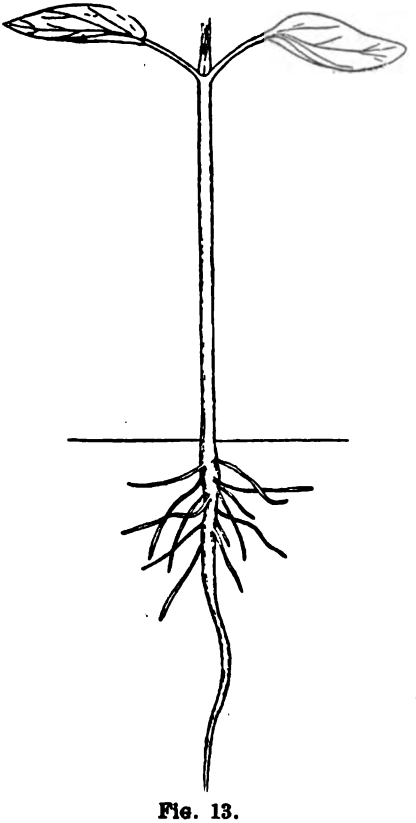

Fig. 13.

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Every part of the plant has its work to do and its whole structure is expressly adapted to this work. Notice the root, for instance. See the multitude of tiny hairs which help it to absorb water and food. Where the root is covered with these hairs the absorbing surface is ten to twenty times as great as elsewhere. Notice the root-cap which protects the delicate tip as it is driven downward into the soil. (Roots allowed to develop between pieces of moist blotting paper show the hairs well; cuttings of Wandering Jew placed in water develop roots which show both the cap and the hairs admirably). Is the root driven down into the soil with much force? We may find out by a very simple contrivance. Remove the top and bottom from a shallow wooden box. Replace the bottom by wire-netting with meshes about one-quarter of an inch square. Cover this with a piece of tin-foil and on this place enough earth to fill the box. Place seeds in this and suspend the box at a convenient height so that when the roots come through the bottom they can be easily observed. How thick a piece of tin-foil will they penetrate? Try different kinds of seeds.

What drives the root downward with so much force? Why are not the side roots torn off as the root moves downward? We may answer both these questions by marking a root with ink-dots (waterproof ink is best; it should be put on with a small brush) about one-sixteenth of an inch apart and allowing it to develop in water.* We shall then see the marks separate near the tip, showing that the root is elongating there, while higher up is a region where they do not separate. It is only in this upper region that the side roots come out.

Does the stem have a similar elongating region? Where are the new leaves formed? What would happen to the stem if this elongating, formative region were removed? Select Scarlet Runner seedlings about two inches high

* Tie a piece of cheese-cloth over the mouth of a tumbler; thrust the root through it; pour in water until the seed-leaves are partly submerged and invert a second tumbler over the first.

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(above ground) and cut off the stem below the first pair of foliage-leaves. In a few days you will see new stems or branches starting out. Where do they appear to come from? (See Fig. 14.) In a short time these will be followed by others until a dozen or more are growing up to take the place of the one which has been removed. Try the same experiment on other kinds of plants. Now let us remove the elongating region of the root and see what will happen. Do new roots come out? Where? Do they grow horizontally like the side roots or straight downward like the main root? The roots should be allowed to develop in water so as to be easily observed.

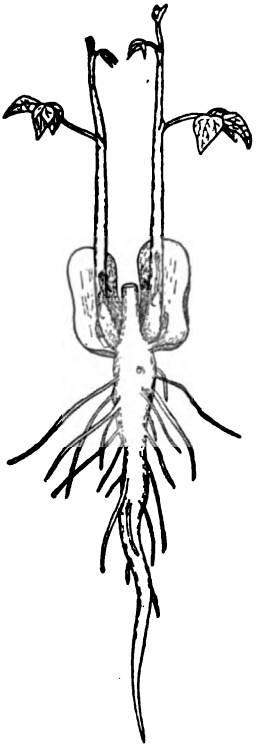

FIG. 14.

Does the main root always grow straight downward? Try placing the seed in various positions to see if this affects the direction of growth. The seeds may be placed on the surface of moist earth (and covered as described above) or may be pinned on corks in various positions and the corks may float on the surface of the water in a shallow dish. A little cotton laid over the seed-leaves and dipping in water will keep them moist. After the root has grown a little, change the position of the seed so that the root points straight upward or is horizontal. Does it begin to grow down again? Why does the main root persist in growing downward no matter in what position the seed may be placed? The idea has been put forward that the root tip not being very rigid droops downward of its own weight, and this starts the growth in the right direction. This

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idea can be tested by a very simple experiment. In a small glass dish place some mercury; split a cork and fasten it to the side of the dish (Fig. 15). To this pin a germinating seed with a perfectly straight radicle about an inch in length. Place the radicle in a horizontal position and resting on the surface of the mercury. Pour on enough water to partially submerge the seed. In a few hours the root-tip will bend downwards and penetrate the mercury, overcoming its resistance (Fig. 15).

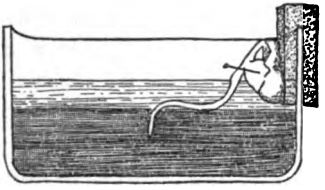

FIG. 15.

It would seem that gravity must determine the downward growth of the root. Now, if this be so, what would happen if we make the force of gravity of no effect by placing the seed on a revolving wheel? If the wheel turns always at the same rate, each side of the root will feel the downward pull of gravity for a short time, but no side will feel it more than another. So when all sides are equally affected, will the root have any tendency to bend in one direction more than another? Let us see. The construction of the wheel is a very simple matter. Have a plumber or tinsmith cut out of thin sheet zinc a circular piece six inches in diameter. Have this cut to allow the insertion of corks as shown in Fig. 16. Let the flaps made by cutting remain in place. Fix round, flat corks in the cut places, and bend the flaps so as to support the corks as firmly as possible. For the axle use a knitting needle, impaling two rubber corks upon it, one on each side of the zinc disc (Fig. 16, A) to hold the latter in place. They should press firmly against the disc to insure its turning with the axle. Two upright wooden supports fastened to a block of wood are pierced by holes just large enough to admit small glass tubes in which the axle rests. One of these (Fig. 16, C) is closed at one end to keep the axle from slipping too far; the other (Fig. 16, B), being open at both ends, allows the axle to pass through, and (being bent at a right angle as shown in

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the figure) to be fastened by fine wire to the minute-hand of a clock. This apparatus, which almost anyone can easily make in a little while, permits of some exceedingly interesting experiments, and answers the purpose as well as a costly instrument. Select some peas with radicles about half an inch long; partially envelop each one in wet cotton

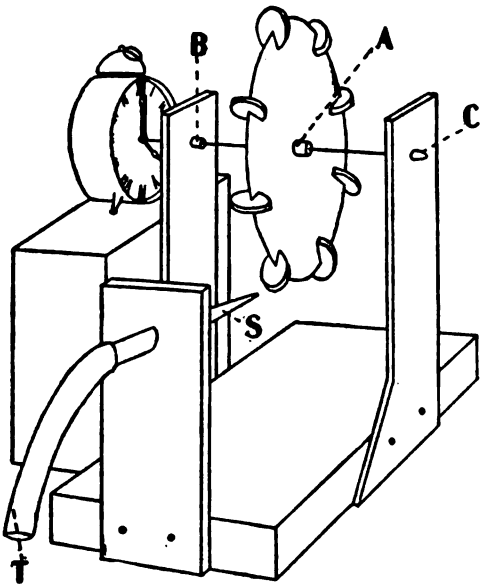

FIG. 16.

and pin them upon the corks. Arrange a saucer of water so that as the wheel revolves the seeds will dip into it and be kept moist. The seed itself need not come in contact with the water, but a little strip of cloth or filter paper may be arranged so as to hang down from the seed and touch the water. The clock is set agoing and the wheel revolves once an hour. The seeds grow well under these conditions, but the direction of growth is no longer the

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same for all the roots. Instead they may grow in almost any way. Often we see some of them turn and grow in the same direction as the stem. How do the stems behave? The directing power of gravity being removed, both stems and roots grow in quite haphazard fashion.

We may now go a step further and substitute a new force for that of gravity. This we may do by making the wheel revolve more rapidly. If you bend a piece of wire around the spoke of a wheel, so as to form a loose ring, and spin the wheel rapidly, the ring will be violently hurled to the rim of the wheel by a force commonly called centrifugal force. If the wheel be revolved rapidly enough the centrifugal force will be much greater than the force of gravity. Will a seed placed on such a wheel direct its roots in accordance with the centrifugal force? To test this we remove the clock and saucer, place the apparatus in a sink, and attach the rubber tube, T, to a faucet. At the end of this tube is a piece of glass tubing, S, drawn to a point. The manner in which this is supported is shown in the figure. It should be wedged firmly in place by wooden wedges, and be directed so that the stream will strike the wheel just at its rim. The stream must be powerful enough to make the wheel revolve rapidly. A piece of cloth must be put over and around it, like a tent, to confine the flying drops. In the course of a day or so, provided the wheel is turning rapidly enough, we shall see the roots all bending away from the center of the wheel and growing straight out in the direction of the radius, while, on the other hand, the stems grow straight in, pointing their tips toward the center of the wheel.

Let us see what will happen if we place the apparatus on its side so that the wheel revolves horizontally, the closed tube, C, being below. If the plants have become inconveniently large we may replace them by fresh ones with radicles about an inch long. Two forces now act on the plants, the centrifugal force and that of gravity. The roots take up an intermediate position, growing away from

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the center of the wheel as before, but also obliquely downward; the stems grow in an exactly opposite direction.

These experiments lead us to think that when the root and stem issue from the seed, gravity determines the direction in which they grow. And so we can understand how the seed, whether above ground or below, unerringly sends its stem and root in the right directions. We can easily understand that this is a very important matter for the plant, for the quicker it gets its stem above ground, into the light and air, and its roots down into the soil to find food and moisture, the better will be its chances of living through this first period of its independent life, which is more critical and beset with dangers than any other.

The root goes down into the ground to seek for water. Sometimes we find drains or cisterns choked by roots which have grown into them from trees many yards away. This leads us to suspect that roots seek for water. Can you think of any way to test this idea? Here is a very simple one, but you may think of one equally good. A glance at Fig. 17 will explain it. The seeds have been

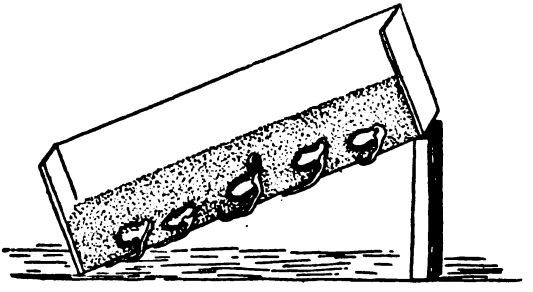

FIG. 17.

planted in damp sawdust, in a box with a bottom made of wire-netting. The roots, growing straight down at first, meet the dry air and turn back, some of them at least, to

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the damp sawdust. In this case moisture seems to be more powerful than gravity in directing their growth, and we can readily see that this is of advantage to the root, since its function is to seek and absorb water.

Now the stem goes above ground to seek light. Does it have the power of growing toward the light as the root does toward moisture. Can you think of a way to answer this question? The easiest way is to cover the plant and the pot in which it is growing with a box, and make a hole at one side to admit light. Then if the plants have any tendency to grow toward the light, it ought to show itself.

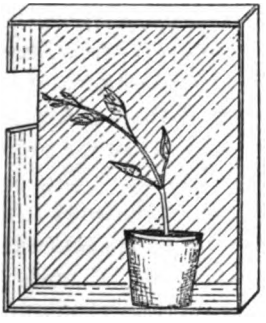

FIG. 18.

The result of this experiment is shown in Fig. 18; in this case a Scarlet Runner was placed in a wooden box, one side of which is removed to show the plant. Radishes are good for this experiment. They come up quickly and are very sensitive to the light. We must not forget that the whole object of seeking light is to expose the leaves to it. In what position will they catch the most light? Do you generally find leaves in this position? Observe all the plants you can out of doors to see how their leaves are placed. Notice especially plants growing near walls or houses, or in any position where they get the light from one side only. Do you find the leaves facing the side from which the light comes? Is this arrangement due to the light itself? Grow some Nasturtiums in pots and place them in a box which admits the light on one side only. When the leaves have all turned so as to face the light, turn the plant around so that they face away from it. How long is it before they begin to turn back again? Try them before a window in the same way.

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The English Ivy (Fig. 19) is interesting to experiment with; but it takes too long to grow it in pots, so we will use a quicker method. Find some plants growing where they get plenty of light, and bending back some of the branches tie them so that the side that was shaded before now gets the light. How do the young leaves place themselves? On which side do the new roots come out? Where do the new leaves appear? Does this indicate that light influences roots as well as stems and leaves? The Nasturtium leaves turn to the light much faster than the Ivy leaves, but there are others which move still faster. If you watch the leaves of the Lupine, you will see that they follow the sun all day long, facing east* in the morning and west* in the evening. Can you find any other plants which do this? Are there any flowers which behave in this way?

FIG. 19.

It must be a great advantage to the plant to have its leaves following the sun in this way, for of course they must get much more light. But most plants must be content to have their leaves remain in one position, or at least move very slowly indeed. It is, then, all the more important to have the leaves placed in the most favorable way possible. If they are crowded one above another, they will keep each other from getting the light they need for making starch. Can you find any indications of a skillful arrangement for avoiding this? Look at a branch of the Chestnut (Fig. 20) or Ivy-leaved Geranium (Fig. 21) and notice how the leaves are placed. Do they shade each other? This arrangement has been called a leaf-mosaic. Do you see why? Can you explain how this clever arrangement is brought about? What are the best leaf-mosaics you can find?

*i.e., Northeast or -west, or southeast or -west, according to the season.

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FIG. 20.

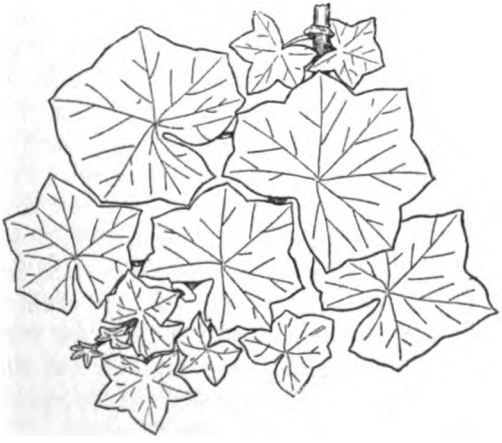

FIG. 21.

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We have scarcely made a beginning of our experiments, yet they have already led us into the fields to study plants as we find them. Here there is always something of interest for eyes which have learned to see. With a little guidance the child learns to see more and more for himself, and strives more and more to see aright, to draw and describe things as they really are. So the love of nature leads him to the love of truth. These twin influences, upbuilding both mind and character, should come early to the child and be a lifelong inspiration.

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THE CONDITION OF HISTORY IN THE SECONDARY SCHOOLS OF CALIFORNIA.*

By KENDRIC CHARLES BABCOCK.

The excellent paper to which we have just listened is quite beyond criticism save for its self-confessed incompleteness, and I shall therefore confine myself in the main to an attempt to supplement it. What I have to say is not based on any collection of statistics, nor on written information, but on careful personal observation of some thirty secondary schools in their regular work, and on conferences with men who have similarly examined the other secondary schools of the State. The schools which I have examined, many of them several times in the past three years, are all north of the Tehachapi, but I know of no good reason to suppose that these northern schools differ materially from those of the south. Let me make clear one fact: I am speaking personally and not officially, for myself and not for the Department of History of the University of California. It is not as a scribe nor yet as one having authority that I take part in this discussion.

The reports on which Miss Anderson has based her paper, cover the work of only seventy-three schools, and it is not quite fair to assume that the average of these would be the average of all the schools of the State. It would be

* Delivered before the California Teachers' Association, at Sacramento, December 29, 1899, in discussing a paper on this subject by Miss Blanche J. Anderson, of Stanford University.

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necessary to know what schools were not on the list used before we could accept even the tentative conclusions. There are this year somewhat more than one hundred and twenty secondary schools applying to the University of California for accrediting; of these, every one applies in the subject of civil government, and all but three in at least one other subject in history. The paper just read deals with only three-fifths of the number. I believe its conclusions would be modified in several important particulars if returns had been made by all.

So far as the figures given relate to the subject of American history, they are apt to be misleading. That subject appears to receive only twenty-one and one-half per cent. of the time devoted to history, while Greek and Roman history receive thirty-six per cent. Perhaps this may be the average ratio at the present moment, though I am inclined to doubt its accuracy. But even if it does, it represents a passing condition. Beginning with the academic year, 1901–2, the entrance requirement for the University of California will be American History and Civil Government. This will probably place this combination of subjects on an equality with the other subjects, for it is added to the requirements as they now stand; it is not a substitute for any other history subject. More time is to be given to the American history; whence it comes does not immediately concern us at this time. Already some of the best high schools have anticipated the new requirement, and are now teaching the American history along with the civil government; next year still others will adjust themselves to the new conditions. The stimulus given to popular interest in the history of the United States by the recent war with Spain, will undoubtedly make it easier than it otherwise would have been, to accord to American history the recognition and footing which it deserves, and which it has been too long denied as a secondary school subject.

The condition of history in the secondary schools of California has unquestionably improved in the three years

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during which I have been observing it. There seems to be a better sentiment in the community as to the value of the subject in secondary instruction; more time is given to it; the methods in teaching it are better; it is more and more rare to find a teacher without any previous training in the subject, set to teaching history, with the sole qualification that he or she can read English with more or less understanding. History will never be well taught until the teacher has that grasp of the subject, that enthusiasm for it, which ordinarily comes only from careful training under a master in history. I am not urging that the teacher of history should be a specialist, devoting his whole time to that one subject, though I know of no serious objection to such a condition. But history should be something more to him than an occasional interest, something better than information for revenue only. For the teacher of history in a secondary school, it is by no means an unmitigated evil to have to teach some other subject for which he may be well prepared; if he be teaching Latin in connection with his Roman history, both subjects will probably profit by the combination.

One way of measuring the growing interest in history is found in the increasingly frequent inquiries which we are called upon to answer, regarding books for a school library. The boards and the principals are ready to give money to strengthen this department of the school's work. One school recently asked for a prescription for spending an appropriation of $75.00 for American history, while another has this year spent $400.00 for books covering the general field of history. All these are hopeful signs that the renaissance of interest in the history of our own time and our own country, which has come as one of the results of the events of the past year and a half, will bring in the desired reformation in teaching history. Perhaps with deeper and more vital interest, coupled with more careful study, there will come a saner, more intelligent, less noisy patriotism, a patriotism of expectation and determination

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as well as of vociferous assertion and desire. Perhaps the time will come when I shall not feel in duty bound, in lecturing to my University classes, to espouse the British side of the Revolution quite so earnestly as I do now in order to overcome ingrained prejudices.

Another evidence that history is faring better in the schools, is clearly seen in the increased numbers electing the freshman courses in history in the University. Not so many students come in with a dislike for the dry-as-dust subject, a dislike which may be outgrown only in the senior year when it is probably too late to do justice to the newly discovered interest. Instead of this, more and more come with a distinct predilection for the study of history and the allied branches of economics and politics. A few figures will make the matter clearer. In the University of California, we give each half-year a course entitled, Introduction to History and Economics, designed especially for freshmen. The numbers electing this course during the first half-year have increased in a far greater ratio than the numbers for the whole undergraduate body; nor does this increase seem to be at the expense of the course in the second half-year. Two years ago there were in the first half-year, in round numbers, 120; last year, 150; this year, 180. The increase has not stopped with this course, for figures show a similar increase in the advanced work, for which the impetus could hardly have come solely from the work of the freshman year. But this course, taking the students fresh from the secondary schools, furnishes a peculiarly good test. In this connection it is worth noting that there is a gratifying tendency among the teachers of history to seek in a year or two of graduate study, better preparation for the growing demands upon them. In some instances, sacrifice of place and prospects has been made in order to do this. At least eleven such cases have come to my notice during the last two years.

There are some other phases of this subject which are not so gratifying as those signs of progress of which I have

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been speaking. The work of coördinating the different parts of the study leaves very much to be desired. History does not repeat itself, but there are certain great permanent forces which work out from time to time in a strikingly similar, though cumulative, fashion, and it is the sure and unmistakable sign of a good teacher, that, by comparing these manifestations, the pupil is made to realize the unity of history and the reality of the life of men of other, even very remote, days and conditions. Take the matter of expansion of peoples and nations as a familiar example. Unless the student, as he goes on in his study, sees clearly some likeness of motives, processes, and results in the expansion of Greece, Rome, Spain, and England, not to mention the United States, there is something the matter with the teaching and probably with the teacher. The new entrance requirement will furnish a variant illustration. I do not believe that the best results in American history will be obtained by devoting one half-year to the history and the other half to the civil government, nor yet by adopting a scheme by which one subject will get two periods a week, and the other three periods. They must go together; as the story of the colonization of New England is taken up, the study of the township should go with it with such divisions of time as suit the teacher. So when the "critical period" is studied in the order of development, the close, intensive examination of the Constitution should follow. Here too might be the best place for the introduction and discussion of some of the more abstract notions of politics, such as the nation, the state, sovereignty, and law.

In the matter of expression, while there is evidence of some progress, there is abundant reason for sharp criticism and complaint. The ability to state information and conclusions in clear, connected, straightforward speech, is not receiving enough attention from teachers of other subjects than English. So deeply has this fact been impressed on the University examiners, that they have added to the entrance requirements, English A, Oral and Written

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Expression, which affects all subjects as well as the English proper. The opportunity of the teacher of history for cultivating oral expression is second to none, and the results obtained in certain schools,—for example, the Girls' High School in San Francisco, where the accuracy and readiness of speech are noteworthy,—show that the ideal set is not at all an unattainable one for the majority of the high schools of this State.

Summarizing in a few words, I believe that the teaching of history in the secondary schools of California is steadily improving, and that the sentiment in support of the subject is growing everywhere. Whatever else may lose in the struggle for a place in the already crowded schedule, it is not likely to be history. California in these matters is already ahead of most other states, and this fact, with those just mentioned, should give us courage and hope in striving for still greater improvement.

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THE VOICE IN SPIRITUAL EDUCATION.*

By FLETCHER B. DRESSLAR.

"To keep music in the schools is a necessity, and youth ought to be kept practicing this art, for it makes skillful, genteel people of them. A schoolmaster must be able to sing, or I would not recognize him." These are the words of Martin Luther, who wrote them at a time when the best music was cultivated almost exclusively for church services. His keenness in observation and his interest in education, however, led him to recognize the true value of music, despite the fact that it had been held within comparatively narrow channels by the church.

These introductory words will serve to suggest my theme. It is my desire to make a plea for better music work in the grades, and only incidentally to touch upon oral reading. You have of course noted that the title announced is an adaptation of one used by Professor Hiram Corson in one of his volumes, "The Voice and Spiritual Education." While I shall emphasize the subject from a different point of view, I wish to recommend his volume to all who appreciate the power of the voice, and are seeking help in teaching reading and literature.

The child is born physically deaf, and its ears are not unstopped until from three to ten days after birth. Gradually the ear becomes more delicate and capable of transmitting a greater and greater range and variety of

*Read at a meeting of the Musical Section of the California Teachers' Association, held at Sacramento, December, 1899.

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excitation. When anatomically perfect the ear offers opportunity for cultivation far beyond that which is attained by our best musicians. Mr. Gilman, the Curator of the Boston Museum of Fine Arts, told me that he found it necessary, during the progress of his valuable study of Chinese music, to train himself to recognize and appreciate differences in pitch equal to one-eighth of a tone, "and," he added, "I did not find it a long and difficult task." Most of us are well satisfied if we acquire the power to distinguish readily and accurately differences of a half tone. But this satisfaction and this half development are due to lack of attention and mental training, not to a lack of organic ability. It is surprising indeed to see how many intelligent people there are, who believe themselves unable to learn to sing or even to appreciate music; and, as a result of this loss of faith in themselves, give no attention to cultivation of power along this line at all. Most of this apparent inability is due simply and solely to self-delusion.

It is a fact, made clear by scientific investigations and by common observation, that there are far fewer children functionally disqualified from learning to sing than there are of those who are color blind. Of course some children acquire the ability to sing much more readily than others, and show far greater talent in this direction. But such differences are exhibited in all other subjects, and ought to be expected in music. All are not equally quick in arithmetic. Some children readily acquire the power to express themselves in clear, forcible English, while others are tediously vague and halting of speech. Other things equal, children in the primary grades show a more decided taste for music than for any of the other subjects of the curriculum. For it must be remembered that the desire to express the emotional life through song and chant, is one of the most fundamental and deeply-rooted instincts of the race. Some instincts show a certain transitoriness, or a certain tendency to disappear with the progress of civilization; but this is not true of the instinct for musical expression. On

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the contrary, while it shows itself very early in the life of the child, it persists in most cases throughout life, even to old age, and, with any sort of adequate opportunity, develops into a higher and more spiritual yearning.

In this fact music finds its chief claim as an educational agency. It is capable of moulding and developing the sensibilities of the race, for it lends itself to the whole range of emotional expression. It would be very foolish to claim that music could do this unaided. Indeed, it seems to me that we should look with more disfavor upon narrow specialization in music than we should upon narrowness in almost any other line of worthy endeavor. People who know nothing but music are usually disagreeable people, and, did it not seem a contradiction in terms, it would be safe to say that they are rarely truly musical. By this I mean to say that those who have not in some way brought themselves into harmony with the ideals of a liberal and many-sided culture, have no enlarged, noble, and serviceable sentiments to express.

Music, as an educational factor, exhibits its chief usefulness in moulding, directing, and shaping the spiritual life, which has grown up as a resultant of all the agencies brought to bear upon the intellect, the sensibilities, and the voluntary life of the individual. It harmonizes the life, it unifies the spirit, and, to use the phrase of President Stanley Hall, "it cadences the soul." The whole life needs an emotional focus as well as an intellectual focus. It needs to be gathered together and given power to express its emotional ideals, just as it needs intellectual unity and strength to put forth a valuable theory, devise a useful invention, or direct in the practical affairs of life.

It is neither my intention to argue nor my wish to suggest that music is the only means of developing, unifying, and expressing the emotional life; but there is a desire to say that there is no other instrumentality so universal in its application, and none other so free from technical difficulties and hindrances as vocal music.

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The proper use of pictures in school work is an important obligation and ought not to be neglected by any teacher, especially in these latter days when we can get an artistic reproduction of a masterpiece for a penny. But we receive a picture, and in most instances never create one. Every song, however, demands action, and in a very vital way is a product of the singer. Besides, art for the eye can only represent a single phase or at most a few phases of the ideal which the artist had in mind; whilst music can begin a theme or emotional ideal and carry it through the whole gamut of its transitions and present it in its completion.

Music does not pretend to be a practical subject. It is a spiritual subject. This is the chief reason why we should all be anxious to do what we can to make it possible for teachers to give more time to music in our schools. The greatness of a civilization cannot be measured alone by its commerce, its inventions, or its literature; but by all these and more. The desire and to some degree the ability to express the purely emotional through music is well-nigh universal and, what is more important, it has ever been so. It is my desire not to over-estimate the value of music in the spiritual development of the child, but it is not unsafe to say that it is the subject *par excellence* which appeals to the spiritual natures of children. Other subjects of the curriculum make too great demands on the intellect, and as a result, if we depend on them for emotional food, the most important time for growth, the nascent period, is thus lost. Early training in singing is necessary if we hope to succeed in properly moulding the human spirit. Music, therefore, especially commends itself to us as an indispensable instrument in the careful education of young children. Still, by emphasizing its value in the early school years, there is no intention of suggesting by way of contrast its lack of importance later.

In the delightfully natural and simple story of his life Charles Darwin says that up to thirty years of age, he took

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great delight in poetry and music, but that from his habit of dealing only with intellectual things in later life, Shakespeare nauseated him and he lost his taste for music. He says his mind became a sort of machine for grinding out general laws from observed facts. He adds, "If I had my life to live over again I would have made a rule to read some poetry and listen to some music at least once a week; for perhaps the part of my brain now atrophied would thus have been kept active through use. The loss of these tastes is a loss of happiness, and may possibly be injurious to the intellect, and more probably to the moral character by enfeebling the emotional part of our nature." Goethe says: "A man should hear a little poetry and see a fine picture every day of his life, in order that worldly cares may not obliterate the sense of the beautiful which God has implanted in the human soul."

Now if these foregoing statements are true, and we certainly believe they are, what ought we to do? How can we deal with music in the schools to the best advantage of the children? At the risk of being very dogmatic, and of appearing to cover ground which would seem to demand the wisdom of a specialist in both music and education, I am going to voice for the first time what it seems to me we must do to make our music in the public schools what it should be—a more potent agency for spiritual growth:

(1) Save time on our daily programmes for music, and slight it no more than we do other subjects. It is not necessary nor is it advisable to give it as much time as we give to the English work, but such time as we know it ought to have, use this time for nothing else.

(2) Cease wasting the time of the little folks by introducing them to music through the use of notes. Learning to read music is important, but learning to hear it and to sing it is of far greater importance and should come first. It is as unpedagogical to set children to work to learn the technical details of music before they have learned to sing as it would be to undertake to teach them to compose before

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they can speak, or to dance before they can walk. It is certainly irrational to expect the children of the primary grades to do much singing, when three-fourths of the time set apart for music, is taken up with drill on sharps and flats, keys and staves. Publishing firms are adding fuel to the flame, by urging upon teachers all kinds of so-called systems of music, all devised to keep the little folks busy day after day on the merest technicalities. Thus it happens that the best time to create a taste for good music is not only allowed to pass by unused, but a dislike for the music work is often developed and worse still a misunderstanding of it is engendered.

(3) Teachers must cease to be indifferent to the value of music, and must come to feel their proper responsibility regarding their preparation to teach it. It may be well to have special teachers for music in city schools, but this will depend entirely upon the teacher, and her fitness. My experience has led me to believe that very few of our special teachers of music know anything about what is best for children to do. Usually such teachers are selected wholly upon the basis of personal attainment in music, and hence, if they learn to teach properly at all, they do it at the expense of the children. Special teachers of music, who have not studied the subject carefully from the educational side, invariably begin at the wrong place. They burden the children with technicalities and so-called methods, instead of teaching them to sing. If we are to use the public schools as an opportunity for developing a worthy taste for good songs, the regular teachers must do the main part of the work. They cannot shift the responsibility upon the special teachers who may see the children not oftener than once a month. So it is perfectly justifiable to require some musical ability of all teachers.

(4) Progress in music must be measured mainly by the ability to express and interpret it, not merely by the ability to read it. English teachers surpass us in their music in the schools, because they emphasize the singing almost

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exclusively. When John Curwen introduced the Tonic-Sol-Fa into the schools of England, he did it not because he wished to do away with the staff notation, but to prevent the teachers from wasting the children's time, and to make it possible for the people to sing. The teachers of Germany are skillful in the teaching of music because they teach it in a psychological way rather than in a logical way. They teach their children to sing many songs by rote, and to sing them well. Then they approach the notes through these songs. In this way they give their pupils excellent drill in singing, and when the proper time comes easily lead them to read music through songs which they already know. Twenty years ago the National Teachers' Association of Germany passed a series of resolutions embodying their principles relating to the teaching of music in the public schools. With your permission I should like to read some of these because they represent fairly well what has been going on there ever since in the way of music teaching in the schools:

(a) Artistic results can not be expected and must not be demanded, but an inspiration for musical perfection should be awakened in the pupils.

(b) No songs should be taught and practiced which are not of undoubted poetic and musical value.

(c) In the teaching of even the simplest song the object must be to express that which poet and composer intended; the technique is not to be an aim but a means.

(d) The education of the German nation by means of music and through music has a national significance.

(e) Instruction in singing should be given with the aid of a musical instrument, be that violin, piano, or organ; and the instruction can be successful only when the teacher is well trained in the use of his instrument.

(f) Pedagogical treatment in music lessons presupposes a teacher who is professionally prepared, and skillful in the art of music.

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(g) Music is not only to create pleasure in melody and harmony, but it is designed to have an ennobling effect upon the heart.

(5) In striving to help children acquire skill in vocal expression, less can be accomplished at first by directing attention to the physiological processes connected with tone production, than by throwing the initial emphasis upon the proper perception of tone. When children are able to image tones accurately there will be present an inner directing force which will unconsciously help them to properly adjust their vocal organs. This applies to pitch, to quantity, and to quality of tone. And here comes a practical problem for our teachers. Suppose the teacher is unable to distinguish with sufficient accuracy in these things, how is she to get the proper tones for the children to hear? If she cannot sing and has no instrument with which to guide the class, there is nothing left for her to do but to have some of her pupils do the work for her, or else—be married. In almost every school-room of Germany, even in the rural districts, a violin, an organ, or a piano is as much a part of the school furnishings as a black-board, and the teachers are capable performers.

It has been my pleasure recently to teach music for a time in the primary grades, and, notwithstanding it was in a large measure a repetition of former experience, I was astonished, as no doubt you all have been, at the readiness with which the little folks learned a song by rote. Two repetitions, or at most three, were sufficient to teach them both melody and words. No such readiness as this is found in any other subject of the curriculum.

(6) Each teacher ought to have at her command a score or two of beautiful ennobling songs which have grown up out of the hearts of the people. These ought to be selected to suit the advancement and special needs of her class; and she ought to make it her business to teach them to sing these songs with the spirit and the understanding. Wagner expressed a deep truth when he said, "The Folk is the

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epitome of all those men who feel a common and collective want. To it belong then all of those who recognize their individual want as a collective want, or find it based thereon." "The popular airs of Germany," says a recent writer, "both text and melody, are the most fragrant blossoms of that country. The heart of the German people pulsates in these songs, and he who studies them will find revealed in them the German nation in all its strength and weakness, in all its virtues and faults."

One of the serious drawbacks to the progress of music in the public schools of this State has been due to the fact that teachers have not been furnished with lists of good songs suitable to their grades. An earnest attempt is now being made however to remedy this difficulty. Two of our best teachers are engaged in compiling a list of such songs and are to report on their work at this session of the Association. We believe such a collection will be of very great service to the educational interests of the State.

In the early part of this paper it was said that music is not a practical subject, using the word practical in its usual narrow sense; yet we all know that proper training in vocal music aids the pupils greatly in other subjects. The most persistent problem in the teaching of reading and vocal expression in general is the cultivation of the hearing. Unless the child has learned to hear great varieties of tonal expression, it is impossible to teach him to read with sufficient flexibility of voice to make clear the meaning of his sentences. All teachers know how difficult it is to get expressive reading, despite the fact that the thought of the selection may be clear and easily understood. It requires the most persistent and skillful teaching to prevent reading from degenerating into mere word calling. Proper training in singing is of much help here. It renders the voice flexible and creates an internal demand for true vocal interpretation. The cultivation of power to read well, refines not only the emotions to be expressed, but also results in the ability to perceive more clearly the thought

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contained in the selection. It is possible to express by means of a well-trained voice, shades of thought and feeling which words alone cannot carry. There gathers about many words a halo of meaning which the voice alone can reveal. The voice can make clear what explanation and mere words cannot impart. To insist on correct vocal expression is often worth more than to demand analytical exposition. The voice is far more powerful with children than dictionary definitions.

There is properly much made of nature study in our schools to-day, but it is almost entirely for the eye. Who ever heard of a teacher taking her pupils out to listen? If an excursion is made at all it is always to see. Still we are much given to talking about the songs of the birds just as if we knew them quite well. In reality comparatively few of us could identify a score of birds by their notes. This is true notwithstanding the fact that this phase of bird life is of very great interest from a purely scientific point of view. Pardon a single instance by way of illustration: So far as I have been able to judge, the meadow-lark found on this coast is very similar in form, coloring, and habits to the one found in the Middle States; but his note is so markedly different in quality that one listens with much wonder. His environment, his companions, his associations in some way have combined not only to sweeten and enrich his tone, but also to change the form of the melody until the effect is strangely different. The problems of life and evolution are not limited to things visible and tangible, but appeal to the ear as well. He who has been taught to listen and has learned to estimate and interpret what he hears, can go as far into the mysteries of life as he with scalpel and microscope. True, it is another phase of life, but who will dare say that it is less important?

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THE COMMERCIAL MUSEUM.

The first official step in the direction of establishing a Commercial Museum in San Francisco was the passage of the following resolution by the Board of Trustees of the Mechanics' Institute, January 9, 1900:

"WHEREAS, it is greatly in the interest of this City that a Commercial Museum of the kind and pattern of that now in the City of Philadelphia be established here, be it resolved, that Doctor Benjamin Ide Wheeler, President of the University of California, be requested to call at his earliest convenience a meeting of the Boards of Officers of the Chamber of Commerce, Merchants' Association, State Board of Trade, Mechanics' Institute, and such other bodies and individuals as he may deem proper to confer with a Committee of the School of Commerce of the Faculty of the State University in order to take initial steps toward the establishment of a Commercial Museum in this City."

In response to this resolution President Wheeler issued a call to the different trade associations in San Francisco to send delegates to a conference, held at the Mark Hopkins Institute of Art, January 23, 1900. The following named gentlemen were invited to attend:

Merchants' Association: Isaac Upham, S. Sussman, Horace B. Sperry, Everett N. Bee, Adolph Mack, F. W. Dohrmann (President), and J. Richard Freud (Secretary).

California State Board of Trade: J. S. Emory, W. H. Mills, N. W. Spaulding, N. C. Chipman, B. N. Rowley, J. A. Filcher (Secretary).

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Manufacturers' and Producers' Association of California: Wakefield Baker, Charles B. Platt, James W. Kerr, Lippmann Sachs, Eugene Goodwin, Andrera Sbaboro (President).

University of California: Benjamin Ide Wheeler, Arthur Rodgers, Ernst A. Denicke, Carl C. Plehn, George Davidson, Bernard Moses, Armin O. Leuschner.

Chamber of Commerce: Irving M. Scott, W. R. Wheeler, Gustave Niebaum, Rufus P. Jennings, George A. Newhall, Charles Nelson (President), Ebenezer Scott, (Secretary).

Mechanics' Institute: Willis G. Dodd, Byron Jackson, S. J. Hendy, George E. Dow, George Cumming, Mr. Frazer, Joseph M. Cumming (Secretary).

Oakland Board of Trade: M. J. Keller, Cragie Sharp, E. W. Marston (President).

James D. Phelan, Horace Davis, M. H. deYoung, W. S. Leake, A. M. Lawrence, John D. Spreckels, Claus Spreckels, R. P. Schwerin, A. A. Watkins, Louis Sloss, Lewis Gerstle, Hugh Craig.

President Wheeler called the meeting to order and spoke in part as follows:

"I speak at a time when the interests of California, the Coast, and its chief city have reached a crisis in point of their development. The action of the Mechanics' Institute in calling me as the head of the University of California to open this meeting is an indication that something is moving in the life of California as it never moved before. It is no small matter with which we are dealing. It is a matter which concerns the largest life of this community and the largest life of the nation. It has long been thought that sooner or later San Francisco must claim its portion in dealing with the great Orient beyond. Many have been disappointed that San Francisco has not grown as rapidly as expected. But there has been a shifting in the world's interests in the last two years, and the man who fails to see is blind to history and its opportunities.

No matter what may be his political views, the man

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who looks widely can have no doubt of the trend of commerce. It certainly has become perfectly clear that upon San Francisco has been thrown great responsibility and great opportunity. With its magnificent natural harbor on the western shore of the nation, with its power and aggressiveness, California is forcing westward, where lie the great commercial opportunities in the newly-discovered Orient.

The world has passed the stadium where matters of trade and commerce are left to chance. Men are coming to learn that commerce means an understanding and grasp of conditions. Germany has taught us how to proceed. She has gone ahead after the old methods of the pedantic gymnasia; the universities have aided to advance by intelligent methods. The world of the coming century is to be based on a scientific study of what the world needs. We have heard much of the Philadelphia Museum of Commerce. It is ready to place at our disposal its magnificent resources, provided we place our organization above the suspicion of individual usefulness and look to the common good of all.

Shall the city of San Francisco cast off its traditions of the mere individual struggle for existence, and take upon itself the idea of coöperation, merging its strength toward the common good? It is my religion that the way for a man to succeed is to make a success of a community. The community succeeds with the nation and by the community falling in with the current of national endeavor. Shall we join hands in advancing a great community endeavor? Shall we band ourselves together for service in the interests of the Pacific Coast? Let us all remember that what serves the interests of the Pacific Coast serves the interests of the nation which we all love. This is a time when we have reached a crisis in the development of California, of San Francisco, and I feel that this move is an indication that something is stirringw hich means a new life to all of us. There is an awakening such as this community has never before realized."

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Two plans for the organization and maintenance of the Museum were presented, one by Mr. M. H. deYoung and one by Mr. C. C. Plehn. After some discussion of the desirability of such a Museum for San Francisco, the gentlemen present at the conference organized themselves into a Promotion Committee, elected President Wheeler Chairman and Professor Carl C. Plehn Secretary, and authorized the appointment by the Chairman of a Committee of ten together with the Chairman and Secretary on Organization and Maintenance. The sub-committee thus authorized was appointed a week later by President Wheeler in consultation with the presidents of the different trade organizations. That committee consists of Messrs. N. C. Chipman, M. H. deYoung, Arthur Rodgers, James D. Phelan, Lippman Sachs, Andrea Sbarboro, Ebenezer Scott, Claus Spreckels, F. J. Symmes, Isaac Upham, A. A. Watkins, Wm. R. Wheeler, together with the Chairman and Secretary of the Promotion Committee. They are to report at a meeting of the Promotion Committee to be called by the Chairman.

CURRENT NOTES.

During the second term of 1899-1900, the following University Extension courses, free to the public, will be given:

I. Philosophy.—Ten lectures by Dr. W. P. Montague, at the Mark Hopkins Institute of Art. The titles of these lectures are as follows: The nature and scope of metaphysics; The objections to metaphysics; The history of metaphysics; The educational value of the study of metaphysics; The theory of materialism; The doctrine of idealism; The problem of the soul; The problem of God; The religious spirit and the spirit of science; and The metaphysical ideal of life.

II. Geology and Physical Geography.—Ten lectures by Dr. H. W. Fairbanks, in the auditorium of the Young Men's Christian Association Building, San Francisco, on Some Important Events in the Geological History of the Pacific Coast. The titles of the lectures are as follows: Introductory—The relation of the present to the past in the study of the earth; Outline of the geological history of the Pacific

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Coast; Development of the physical features of the earth and their dependence upon the geological structure; The scenic features of the Coast Ranges and their relation to recent geological events; The origin of the Sierra Nevada mountains, the Cascades, and the Great Basin ranges; The earthquakes of California and their effects upon the topography; The extinct volcanoes of California; The glacial period in the Sierra Nevada mountains; Glacial Lake Lahonton, and modern Pyramid Lake, Nevada; and The story of Crater Lake, Oregon. The lectures will be illustrated by lantern slides made from photographs from nature by Dr. Fairbanks.

III. Pedagogy.—Four lectures by Professor Elmer E. Brown, at the State Normal School Building, San Francisco, on The History of American Schools. The titles of these lectures are as follows: Colonial schools; Earlier schools in the United States; Later schools; and American educational ideals.

IV. Lectures on China.—Three lectures by Professor John Fryer, in the rooms of the Adelphian Club, Alameda. The titles of these lectures are as follows: Confucianism; Taoism; Buddhism.

V. College of Commerce Lectures.—Three lectures by Associate Professor Plehn, at the Mark Hopkins Institute of Art. Subject, The Commerce of the Pacific. Five lectures by Assistant Professor Page, at the Mark Hopkins Institute of Art. Subject, The Commercial Development of the United States.

VI. Spanish.—A course in introductory Spanish will be given by Mr. C. H. Howard, at the Mark Hopkins Institute of Art.

VII. Chinese.—A class in the Cantonese language will be conducted by Rev. John E. Gardner, at the Mark Hopkins Institute of Art.

VIII. Archaeology.—A course of lectures on Archaeology by Professor Alfred Emerson, formerly Professor of Archaeology in the American School at Athens, will be announced later.

The eighth annual session of the Southern California Teachers' Association was held at Los Angeles on December 21, 22, and 23. Among the addresses were the following by members of the University of California: The American Boy, and The Relation of the Secondary School to the University, by President Wheeler; The Ethics of Teaching, by Professor Brown; Higher Commercial Education, by Professor Plehn; The Master Teacher, by Professor Bailey; and New Problems in the Study of Society, by Professor Moses.

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On the afternoon of December 29 in the lecture-room of the Mark Hopkins Institute of Art the Philological Association of California was organized. Among the papers read were the following by members of the University of California: The Place of Philology, by President Wheeler; The Pronominal Group of Words, its real Differentia, and its Classification in Modern English, by Professor Bradley; On the Reading of Broken Ionics, by Professor Clapp; On Certain Supposed Irregularities in the Versification of Robert Greene, by Professor Gayley; Dramatic Satura in relation to Book Satura and the Fabula Togata, by Dr. Hopkins; Pleonastic Formative Elements in the Semitic Languages, by Professor Margolis; Cicero's Use of the Imperfect and Pluperfect Subjunctive in *si*-clauses, by Dr. Nutting; Commands and Prohibitions in Horace, by Dr. Price; and A Restatement of Certain Elementary Principles in Latin Prosody, by Professor Richardson.

The thirty-third annual session of the California Teachers' Association was held at Sacramento from December 26 to 30, inclusive. Among the addresses were the following by members of the University of California: Ancient History: its Place and Purpose, and The University and the Schools, by President Wheeler; Personal and Political Interference with the Administration of Educational Institutions and Affairs, by Regent George C. Pardee; The Work of a few typical States toward Greater Uniformity and Usefulness, and Local History in the Schools, Materials and Methods, by Professor Brown; Plant Life in Nature Study, by Dr. Osterhout; The "Source Method" of Teaching History in Schools, by Professor Page; and The Condition of History Teaching in the High Schools of California, by Professor Babcock.

On the evening of December 28 a reception in honor of President Wheeler was held by the Association in the Crocker Art Gallery.

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University Chronicle

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THE CHARTER DAY EXERCISES.

The thirty-second anniversary of Charter Day was celebrated on March 23rd in the enlarged Harmon Gymnasium in the presence of an audience that completely filled the auditorium. After the invocation by the Rev. R. F. Coyle, pastor of the First Presbyterian Church, of Oakland, President Wheeler introduced the speaker of the day, the Honorable Whitelaw Reid.

PRESIDENT WHEELER'S REMARKS.

We are to-day assembled here in recognition of the pious devotion to public causes which laid the foundation of this University. Out of the harsh struggle with nature, out of the fierce rivalry of man with man issued forth, here among the mines and fields, the higher consciousness that we are members one of another and that man liveth not by bread alone. Out of the eater came forth meat, out of the strong came forth sweetness.

The largest public spirit has always, in the history of men, sprung from the soil where individual force and aggressiveness have been at their highest tension. Along the route of commercial empire, as it advances from people to people, locate themselves the universities, the schools of art, the fountains of culture,—at Athens, Alexandria, Rhodes, Bologna, Paris, Leyden, Oxford. It is in the energy of conflict, in the flush of achievement that the

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oxygen of action burns the poison of indifference out of human blood.

When the material fruitage of achievement piles before him, how naturally may man, in a species of self-mockery, ply himself with the query—"What is this all for?"—what was life for? Happy the man to whose eye it is given to see and to whose heart it is given to know that after all life is of no account, wealth is of no avail, power means naught, except as one committed for this brief space to the light of the sun and the opportunity of the earth shall, through his gettings and through his power and place, avail to make this world wherein he lives some little better for his having lived in it. The contribution to the common stock and not the hiding in a napkin becomes, in the eyes of the ultimate judge, and of the consummate justice, the final test of a successful life.

There has been founded here at the gates of the West an institution which represents the finest temper of public spirit. The State has established it and will maintain it, but its development into the greatness that makes its field and its task must look to private aid, based upon the consecration of private holdings to the public welfare.

There has been founded here at the gate of the West an institution which expresses in its highest form the ardor of public spirit. The State has founded it, but the State represents in its organization but a fraction of those powers which society has assembled into itself—powers of wealth and powers of action; and so we shall not expect of the State more than a fraction of that which will be dedicated in wealth and action to the service of this University. This University will be what it shall be because of its response to public need, because of its alliance with public interests, because it shall be settled and intrenched in the hearts of the people of California. This University exists and has existed not for private uses. It exists to serve community interests, and those who are trained here, those who shall gather at this shrine, must come, if they come in the spirit

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of the god of the place, in a spirit of devotion to public causes. The University does not exist that it may place special tools in any man's hands or equip him with arbitrary mechanism and recipe for achieving a personal position, or gaining a private and exclusive success. It exists that it may provide citizens for the State and members of society, men whose hearts shall be larger than the purposes of livelihood by the day, whose outlook shall be broader than the demand for private accumulation and the satisfaction of private ambition. God grant that as the days of the life of this institution are piled upon the days that have passed, there may, in increasing numbers, go forth from it men who are men, men who are clean, men who are strong, men who are true, men who are brave, men who are unselfish, men who will live for the public good, and who will know themselves not as individuals alone, but as members of families, members of communities, members of the State, and citizens of the commonwealth.

We are assembled here to-day under the opportunity of listening to a word concerning the fate, and the duty, and the interest of the country we love. I welcome you to the opportunity. I rejoice that the students entrusted to my care should have their minds turned on occasions like this to the supreme interests of the supreme commonwealth. It is fortunate for us that we can hear these things discussed by men of largeness of view, of largeness of heart, by men who have already devoted themselves and their substance largely to public aims; and it is with great pleasure that I introduce to you to-day a man who has served his country in high station, and served it well, a man who has the instincts of a scholar, and a knowledge of the world, a man who is in sympathy with students and academic interests, and who has the right to speak to you here to-day, a right he has won for himself, and which no man could give him, and no man could take from him. I introduce to you the Hon. Whitelaw Reid.

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MR. REID'S ADDRESS.

OUR NEW INTERESTS.

My subject has been variously stated in your different newspapers as "Current National Questions," or "The Present National Question," or "General Exposition; Not on Anything in Particular." When your President honored me with his invitation to a duty so high and so sudden that it might almost be dignified by the name of a draft, he gave me nearly equal license. I was to speak "On Anything Growing out of the Late War with Spain."

How that war resembles the grippe! You remember the medical definition, by an authority no less high than our present distinguished Secretary of State. "The grippe," said Colonel Hay, "is that disease in which, after you have been cured, you get steadily worse every day of your convalescence." There are people of so little faith as to say that this exactly describes the late war with Spain.

If one is to speak at all of its present aspects on this high day of your university year, he should do so only as a patriot, not as a partisan. But he cannot avoid treading on ground where the ashes are yet warm, and discussing questions which in spite of the present intermingling of party lines and confusion of party ideas, will presently be found the very battle ground of campaign oratory and hostile hosts.

You will credit me, I hope, with sufficient respect for the proprieties of this platform to avoid marked partisan arguments—even though fortified by the express warrant of your distinguished President to discuss national questions from any point of view that a patriot can take. It is profoundly to be regretted that on these questions, which pure patriotism alone should weigh and decide, mere partisanship is already grasping the scales. One thing at least I may venture to promise before this audience of

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scholars and gentlemen on this Charter Day of your great University—I shall ask the partisan Democrat of the present day to agree with me no farther than Thomas Jefferson went, and the partisan Republican of the day, no farther than Abraham Lincoln went. To adapt from a kindred situation a phrase by the greatest popular orator of my native State, and I still like to think, one of the greatest of the country in this century—a phrase applied by him to the compromise measures of 1850, but equally fitting to-day: "If we are forced to part company with some here whom it has been our pleasure and pride to follow in the past, let us console ourselves by the reflection that we are following in the footsteps of the fathers and saviors of the Republic; their garments dyed with the blood of the Red Sea, through which they led us out of the land of bondage, their locks still moist with the mists of the Jordan, across which they brought us to this land of liberty."

Yet, even with those from whom we must thus part company there are elemental truths of the situation on which we must still agree. Some things reasonable men may take for granted; some that surely have been settled in the conflict of arms, of diplomacy, and of debate since the spring of 1898. Regret them if you choose, but do not, like children, seek to make them as though they were not, by shutting your eyes to them.

The new territories in the West Indies and the East are ours, to have and to hold, by the supreme law of the land, and by a title which the whole civilized world recognizes and respects. We shall not speedily get rid of them—whoever may desire it. The American people are in no mood to give them back to Spain, or to sell them, or to abandon them. We have all the power we need to acquire and to govern them. Whatever theories men may quote from Mr. Calhoun or from Mr. Chief Justice Taney, the uniform conduct of the national administration throughout a century, under whatever party, justifies the triumphant declaration of Daniel Webster to Mr. Calhoun over half a

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century ago, and the consenting opinions of the courts since, down to the very latest in the long line by your own Judge Morrow, to the effect, in a word, that this government, like every other one in the world, has power to acquire "territory and other property" anywhere, and govern it as it pleases.

On these points I make bold to repeat what I felt warranted in saying a fortnight ago within sight of Bunker Hill, that there is every evidence that the American people have distinctly and definitely made up their minds. They have not been persuaded and they cannot be persuaded that this is an inferior government, incapable of any duty that Providence (through the acts of a wicked administration, if you choose) may send its way—duties which other nations could discharge, but we cannot. They do not and will not believe that it was any such maimed, imperfect, misshapen cripple from birth for which our forefathers made a place in the family of Nations. They are not misled by the complaint that in a populous region, thronged by the ships and traders of all countries, where their own prosecution of a just war broke down whatever guarantees for order had previously existed, they are violating the natural and inalienable rights of man, by enforcing order. Just as little are they misled by the other cry that they are violating the right of self-government and the Declaration of Independence and the Constitution of the United States by preparing for the distracted, warring tribes of that region such local governments as they may be found capable of conducting in their various stages of development from pure barbarism toward civilization. The American people know that they are thus proceeding to do just what Jefferson did in the vast region he bought from France—without the consent, by the way, either of its sovereign or its inhabitants. They know that they are following in the exact path of all the constructive statesmen of the Republic, from the days of the man who wrote the Declaration and of those who made the Constitution, down to the days of the men who conquered California,

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bought Alaska, and denied the right of self-government to Jefferson Davis. They simply do not believe that a new light has been given to the present apostles of a Little America greater and purer than was given to Washington or to Jefferson or to Lincoln.

So I venture to affirm without qualification or reserve that what is past cannot be changed. There is no possibility that any party in power, whether the present one or its opponent, would or could, now or soon, if ever, abandon or give back one foot of the territory gained in the late war.

We are gathered on another old Spanish territory, gained by our country in war. It shows what Americans do with such acquisitions. Before you expect to see Porto Rico given back to Spain or the Philippines abandoned to Aguinaldo, wait till we are ready to declare, as Daniel Webster did in the Senate, that this California of your pride and glory is not worth a dollar, and throw back the worthless thing on the hands of unoffending Mexico! Till then, let us as practical and sensible men recognize that what is past is settled.

Thus far have we come in these strange courses and to these unexpected and unwelcome tasks by following, at each successive emergency, the path of clear, absolute, and unavoidable duty. The only point in the whole national line of conduct, from the spring of 1898 on to this March morning of 1900, at which our government could have stopped with honor, was at the outset. I for one would gladly have stopped there. How was it then with some at the West who are discontented now? Shake not your gory locks at me, or at my fellow citizens in the East. You cannot say we did it. In 1898, just as a few years earlier in the debate about Venezuela, the loudest calls for a belligerent policy came not from the East, "the cowardly, commercial East," as we were sometimes described, but from the patriotic and warlike West. The farther west you came, the louder the cry for war, till it reached its very acme

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and climax on what we used to call the frontier, and was sent thundering eastward upon the National Capital in rolling reverberations from the Sierras and the Rockies which few public men cared to defy. At that moment, perhaps, if this popular and Congressional demand had not pushed us forward, we might have stopped with honor; certainly not later. From the day war was flagrant down to this hour there has been no forward step which a peremptory national or international obligation did not require. To the mandate alone of Duty, stern daughter of the voice of God, the American people have bowed; as, let us hope, they always will. It is not true that in the final decision as to any one step in the great movement hitherto, our interests have been first or chiefly considered. Thus far the path has been dictated by duty, and duty alone has led us where we are.

But in all the constitutional discussions to which we have referred, one clause in the Constitution has been curiously thrust aside. The framers placed it on the very forefront of the edifice they were rearing, and there declared for our instruction and guidance that "the people do ordain and establish this Constitution * * to promote the general welfare." By what right do statesmen now venture to think that they can leave our national interests out of the account? Who and where is the sentimentalist who arraigns us for descending to too sordid a level, when we recognize our interest to hold what the discharge of duty has placed in our hand? Since when has it been statesmanship to shut our eyes to the interests of our own country; and patriotism to consider only the interests or the wishes of others? For my own part I confess to a belief in standing up first for my own—and find it difficult to cherish much respect for the man who won't: first for my own family rather than some other man's; first for my own city and State rather than for somebody else's; first for my own country; first, please God, for the United States of America. And so, having in the past, too fully perhaps, and on more than one occasion, considered the question of our new possessions in

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the light of our duty, I propose now to look at them further, and unblushingly, in the light of our interests.

Which way do your interests lie? Which way do the interests of California and the city of San Francisco lie?

Three or four days ago when your President honored me with the summons I am now obeying there came back to me a vague memory of the visions cherished by the men you rate the highest in California, your "Pioneers" and "Forty-niners," as to the future of the empire they were founding on this coast. There lingered in my mind the flavor at least of an old response by a California public man to the compliment a "tenderfoot" New Yorker, in the innocence of his heart, had intended to pay, when he said that with this splendid State, this glorious harbor, and the Pacific Ocean, you have all the elements to build up here the New York of the West. The substance of the Californian's reply was that, through mere lack of knowledge of the country to which he belonged, the well-meaning New Yorker had greatly underrated the future that awaited San Francisco; that long before Macaulay's New Zealander had transferred himself from the broken arches of London Bridge to those of Brooklyn, it would be the pride and boast of the denizens of those parts that New York had developed so finely as to be fairly called the San Francisco of the East.

While the human memory is the most tenacious and nearest immortal of all things known to us, it is also at times the most elusive. Even with the suggestion of Mr. Hittell and the friendly files of the Mechanics' Library, I did not succeed in finding that splendid example of San Francisco faith which my memory had treasured. Yet I found some things not very unlike it, to show what manner of men they were that laid the foundation of this commonwealth on the Pacific, what high hopes sustained them, and what radiant future they confidently anticipated.

Here, for example, was Mr. William A. Howard whom I found declaring not quite a third of a century ago that San Francisco would yet be the largest American city on the

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largest ocean in the world. At least so he is reported in the *Bulletin*, though the *Alta* puts it with an "if;" its report reading: "If the development of commerce require that the largest ocean shall have the largest city; then it would follow that as the Atlantic is smaller than the Pacific, so in the course of years New York will be smaller than San Francisco."

And here again was Mr. Delos Lake, maintaining that the 'United States is now on a level with the most favored nations; that its geographical position, its line of palatial steamers established on the Pacific Ocean by American enterprise and soon to be followed by ocean telegraphs, must before long render this continent the proper avenue of commerce between Europe and Asia, and raise this metropolis of the Pacific to the loftiest height of monetary power.'

There was a reason, too, widely held by the great men of the day, whose names have passed into history, for some such faith. Thus an old Californian of high and happy fame, Major-General Henry W. Halleck, speaking of San Francisco, said: "Standing here on the extreme western verge of the Republic, overlooking the coast of Asia and occupying the future center of trade and commerce of the two worlds, * * * if that civilization which so long has moved westward with the Star of Empire, is now, purified by the principles of true Christianity, to go on around the world until it reaches the place of its origin and makes the Orient blossom again with its benign influences, San Francisco must be made the abutment, and international law, the bridge by which it will cross the Pacific Ocean. The enterprise of the merchants of California has already laid the foundation of the abutments; diplomacy and steam and telegraph companies are rapidly accumulating material for the construction of the bridge." Thus far Halleck. But have the Californians of this generation abandoned the bridge? Are we to believe those men of to-day who tell us it is not worth crossing?

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Here, again, was Eugene Casserly, speaking of right for the California Democracy of that date. Writing with deliberation more than a quarter of a century ago, he said: "We expect to stand on equal grounds with the most favored of nations. We ask no more in the contest for that Eastern trade which has always heretofore been thought to carry with it the commercial supremacy of the globe. America asks only a fair field, even as against her oldest and most formidable rivals. Nature and our position as the nearest neighbors to Eastern Asia, separated from her only by the great highways of the ocean, have placed in our hands all the advantages that we need. * * * Favored by vicinity, by soil and climate on our own territory, with a people inferior to none in enterprise and vigor, without any serious rivals anywhere, all this Pacific Coast is ours or is our tributary. * * * We hold as ours the great ocean that so lately rolled in solitary grandeur from the equator to the pole. In the changes certain to be effected in the currents of finance, of exchange, and of trade, by the telegraph and the railroads, bringing the financial centers of Europe and of the United States by way of San Francisco within a few weeks of the ports of China and of the East, San Francisco must become at no distant day the banker, the factor, and the carrier of the trade of Eastern Asia and the Pacific, to an extent to which it is difficult to assign limits." Are the people now lacking in the enterprise and vigor which Mr. Casserly claimed for them? Have the limits he scorned been since assigned, and do the Californians of to-day assent to the restriction?

Take yet another name treasured, I know, on the roll of California's most worthy public servants, another Democrat. Governor Haight, only a third of a century ago, said: "I see in the near future a vast commerce springing up between the Chinese Empire and the nations of the West; an interchange of products and manufactures mutually beneficial; the watchword of progress and the precepts of a pure religion uttered to the ears of a third of the human race." And

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addressing some representatives of that vast region, he added, with a burst of fine confidence in the supremacy of San Francisco's position: "As Chief Magistrate of this Western State of the Nation I welcome you to the territory of the Republic * * * in no selfish or narrow spirit, either of personal advantage or seeking exclusive privileges for our own over other nations; and so, in the name of commerce, of civilization, of progress, of humanity, and of religion, on behalf, not merely of California or America, but of Europe and of mankind, I bid you and your associates welcome and God-speed."

Perhaps this may be thought merely an exuberant hospitality. Let me quote then for the same man, speaking again as the Governor of the State, at the capitol of the State, in the most careful oration of his life: "What shall be said of the future of California? Lift your eyes and expand your conceptions to take in the magnitude of her destiny. An empire in area, presenting advantages and attractions to the people of the Eastern States and Europe far beyond those presented by any other State or territory, who shall set limits to her progress, or paint in fitting colors the splendor of her future? Mismanagement may at times retard her progress; but if the people of California are true to themselves this State is destined to a high position not only among her sister States, but among the commonwealths of the world * * * when her ships visit every shore, and her merchant princes control the commerce of the great ocean and the populous countries upon its borders."

Was Governor Haight alone, or was he in advance of his time? Go yet further back to the day when Judge Nathaniel Bennett was assigned by the people of San Francisco the task of delivering the oration when they celebrated the admission of California into the Union on October 29, 1850. "Judging from the past what have we not a right to expect in the future? The world has never witnessed anything equal or similar to our career hitherto. * * * Our State is a marvel to ourselves and a miracle

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to the rest of the world. Nor is the influence of California confined within her own borders. * * * The islands nestled in the embrace of the Pacific have felt the quickening breath of her enterprise. * * * She has caused the hum of busy life to be heard in the wilderness where rolls the Oregon, and where until recently was heard no sound save his own dashings. Even the wall of Chinese exclusiveness has been broken down, and the children of the Sun have come forth to view the splendors of her achievements. * * * It is all but a foretaste of the future. * * * The world's trade is destined soon to be changed. * * * The commerce of Asia and the islands of the Pacific, instead of pursuing the ocean track by the way of Cape Horn or the Cape of Good Hope, or even taking the shorter route of the Isthmus of Darien or the Isthmus of Tehauntepec, will enter the Golden Gate of California and deposit its riches in the lap of our city. New York will then become what London now is, the great central point of exchange, the heart of trade, the force of whose contraction and expansion will be felt throughout every artery of the commercial world; and San Francisco will then stand the second city of America. * * * The responsibility rests upon us whether this first American State of the Pacific shall in youth and ripe manhood realize the promise of infancy. We may cramp her energies and distort her form, or we may make her a rival even of the Empire State of the Atlantic. The best wishes of Americans are with us. They expect that the Herculean youth will grow to a Titan in his manhood."

Nor was even Judge Bennett the pioneer of such ideas. Long before he spoke or before the Stars and Stripes had been raised over Yerba Buena, as far back as in 1835, the English people and the British government had been advised by Alexander Forbes that: "The situation of California for intercourse with other countries and its capacity for commerce—should it ever be possessed by a numerous and industrious population—is most favorable. The port of

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San Francisco for size and safety is hardly surpassed by any in the world; it is so situated as to be made the center of the commercial relations which may take place between Asia and the western coast of America. * * * The vessels of the Spanish Philippines Company on their passage from Manila to San Blas and Acapulco generally called at Monterey for refreshments and orders. * * * Thus it appears as if California was designed by nature to be the medium of connecting commercially Asia with America, and as the depot of the trade between these two vast continents, which possess the elements of unbounded commercial interchange; the one overflowing with all the rich and luxurious commodities always characteristic of the East, the other possessing a superabundance of the precious metals and other valuable products to give in exchange. * * * If ever a route across the Isthmus shall be opened, California will then be one of the most interesting commercial situations in the world; it would in that case be the rendezvous for all vessels engaged in the trade between Europe and Asia by that route. It is nearly mid-voyage between these two countries and would furnish provisions and all naval supplies in the most ample abundance; and most probably would become a mart for the interchange of the commodities of the three continents."

Let no man fancy that these sometimes exuberant expressions of a noble and far-seeing faith by your own predecessors and by a prescient foreigner have been revived in derision or even in doubt. Those were the days when, if some were for a party, at any rate all were for the State. Those were great men, far-seeing, courageous, patriotic, the men of Forty-nine, who in such lofty spirit and with such high hope laid the foundation of this empire on the Pacific. Distance did not disturb them, nor difficulties discourage. There sits on your platform to-day a man who started from New York to California by what he thought the quickest route, in December, 1848; went south from the Isthmus as

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the only means of catching a ship for the north; and finally entered this harbor, by the way of Chili, in June, 1849. He could go now to Manila thrice over and back in less time. And yet there are Californians in this day who profess to shrink in alarm from the remoteness and inaccessibility of our new possessions! Has the race shrivelled under these summer skies? Has it grown old before its time? Is its natural strength abated? Are the old energy and the old courage gone? Has the soul of this people shrunk within them? Or is it only that there are strident voices from California, sounding across the Sierras and the Rockies, that misrepresent and shame a State whose sons are not unworthy of their fathers?

The arm of the Californian has not been shortened that he cannot reach out. The salt has not left him that he cannot occupy and possess the great ocean that the Lord has given him, nor has he forgotten the lesson taught by the history of his own race (and of the greatest nations of the world), that oceans no longer separate—they unite. There are no protracted and painful struggles to build a Pacific railroad for your next great step. The right of way is assured, the grading is done, the rails are laid. You have but to buy your rolling stock at the Union Iron Works, draw up your time-table, and begin business. Or do you think it better that your Pacific railroad should end in the air? Is a six-thousand-mile extension to a through line worthless? Or is it that your Scott shipyards can only turn out men-of-war? Can your Senator Perkins only run ships that creep along the coast? Is the broad ocean too deep for him or too wide?

Contiguous land gives a nation cohesion; but it is the water that brings other nations near. The continent divides you from customers beyond the mountains; but the ocean unites you with the whole boundless, mysterious Orient. There you find a population of over six hundred millions of souls, between one-fourth and one-third of the inhabitants of the globe. You are not at a disadvantage in

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trading with them because they have the start of you in manufactures or skill or capital, as you would be in the countries to which the Atlantic leads. They offer you the best of all commerce, that with people less advanced, exchanging the products of different zones, a people awakening to the complex wants of a civilization that is just stirring them to a new life.

Have you considered what urgent need there will be for those new fields? It is no paltry question of an outlet for the surplus products of a mere nation of seventy-five millions that confronts you. Your mathematical professors will tell you that at the ratio of increase established in this nation by the census returns for the century just closing, its population would amount during the next century to the bewildering and incomprehensible figure of twelve hundred millions. The ratio, of course, will not be maintained, since the exceptional circumstances that caused it cannot continue. But no one gives reasons why it should not be half as great. Suppose it to turn out only one-fourth as great. Is it the part of statesmanship—is it even the part of every-day matter-of-fact common sense, to reject or despise these Oriental openings for the products of this nation of three hundred million people the twentieth century would need to nourish within our borders? Our total annual trade with China now—with this people whom the friendly ocean is ready to bring to your very doors—is barely twenty millions. That would be a commerce of the gross amount of six and two-thirds cents for each inhabitant of our country in the next century, with that whole vast region adjoining you wherein dwell one-fourth of the human race. Even the Spanish trade with the Philippines was thirty millions. They are merely our stepping-stone. But would a wise man kick the stepping-stone away?

San Francisco is exceptionally prosperous now. So is the State of California. Why? Partly, no doubt, because you are sharing the prosperity which blesses the whole country. But is that all? What is this increase in the

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shipping at your wharves? What was the meaning of those crowded columns of business statistics your newspapers proudly printed last New Year's; what the significance of the increase in exports and imports, far beyond mere army requirements? Why is every room taken in your big buildings? What has crowded your docks, filled your streets, quickened your markets, rented your stores and dwellings, sent all this new blood pulsing through your veins—made you like the worn Richelieu when, in that moment, there entered his spent veins the might of France?

Was it the rage you have witnessed among some of your own leaders against everything that has been done during the past two years; the warning against everything that is about to be done? Was it the proof of our unworthiness and misdeeds, to which we all penitentially listened, as so eloquently set forth from the high places of light and leading—the demonstration that what we needed was to sit under the live oaks and "develop the individual man," nor dare to look beyond; the forgetfulness that muscles grow strong only with exercise; that it is the duties of manhood that takes the acrid humors out of a youth's blood; that it is great responsibility manfully met, not cowardly evaded, that sobers and steadies and ennobles? Was it the long lamentation over how on almost every field we had shown our incapacity; how unfit we were to govern cities, unfit to govern territories, unfit to govern Indians, unfit to govern ourselves;—how, in good old theological phrase, we were from head to foot a mass of national wounds and bruises and putrefying sores, and there was no health in us?

Some one has lately been quoting Lincoln's phrase, "We cannot escape history." It is a noble and inspiring thought. Most of us dare not look for a separate appearance at that greatest of human bars; may hope only to be reckoned in bulk with the multitude. But even so, however it may be with others on this Coast, I, for one, want to be counted with those who had faith in my countrymen; who

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did not think them incapable of tasks to which other nations had been equal; who did not disparage their powers or distrust their honest intentions or urge them to refuse their opportunities; to be counted with those who at least had open eyes when they stood in the Golden Gate!

I do not doubt—you do not doubt, they are the majority. They will prevail. What Duty requires us to take, an enlightened regard for our own interests will require us to hold. The Islands will not be thrown away. The American people have made up their minds on that point if on nothing else.

Well, then, how shall the Islands be treated? Are they to be our wards, objects of our duty and our care; or are they to be our full partners? We may as well look that question straight in the face. There is no way around it, or over, or under, or out of it; and no way of aimlessly and helplessly shuffling it off on the future, for it presses in the legislation of Congress to-day. Wards, flung on our hands by the shipwreck of Spain, helpless, needy, to be cared for and brought up and taught to stand alone as far as they can; or full partners with us in the government and administration of the priceless heritage of our fathers, the peerless Republic of the world and of all the centuries?—that is the question!

Men often say—I have even heard it within a week on this Coast—that all this is purely imaginary;—that nobody favors their admission as States. Let us see. An ounce of fact in a matter of such moment, is worth tons of random denial. Within the month a distinguished and experienced United States Senator from the North has announced that he sees no reason why Porto Rico should not be a State. Within the same period one of the leading religious journals of the continent has declared that it would be a selfish and brutal tyranny that would exclude Porto Rico from Statehood. Only a few weeks earlier one of our ablest Generals, now commanding a department in one of our dependencies, a laureled hero of two wars, has officially reported to the

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Government in favor of steps for the admission of Cuba as a State. On every hand rise cries that in any event they cannot and must not be dependencies. Some of these are apparently for mere partisan effect, but others are the obvious promptings of a sincere and high-minded, however mistaken, impulse.

I shall venture, then, to consider it as a real and not an abstract question—"academic," I think it is the fad of these later days to say—and I propose again (and again unblushingly) to consider it from what has been called a low and sordid point of view; so low, in fact, so unworthy the respect of latter-day altruistic philosophers, that it merely concerns the interests of my country!

For I take it that if there is one subject on which this Union has a right to consult its own interests and inclinations, it is on the question of admitting new States, or of putting territory in a position where it can ever claim or expect admission; just as the one subject on which nobody disputes the right of a mercantile firm to follow its own inclinations is that of taking in some unfortunate business man as a partner; or the right of an individual to follow his own inclinations about marrying some needy spinster he may have felt it a duty to befriend. Because they are helpless and needy and on our hands, must we take them into partnership? Because we are going to help them, are we bound to marry them?

Partly through mere inadvertence, but partly also through crafty design, the wave of generous sympathy for the suffering little island of Porto Rico which has been sweeping over the country has come very near being perverted into the means of turning awry the general policy and permanent course of a great nation. To relieve the temporary distress by recognizing the Porto Ricans as citizens and by an extension of the Dingley tariff to Porto Rico as a matter of constitutional right, foreclosed the whole question.

I know it is said, plausibly enough, in some quarters,

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that Congress cannot foreclose the question—has nothing to do with it, in fact—but that it is a matter to be settled only by the supreme law of the land, of which Congress is merely the servant. The point need not be disputed. But it is an unquestioned part of the supreme law of the land, as absolute and as binding as any clause in the Constitution itself, which declares, in the duly ratified treaty of Paris, that the whole question of the civil rights and political status of the inhabitants in this newly acquired property of ours shall be reserved for the decision of Congress! Let those who invoke the supreme law of the land learn and bow to it.

As to the mere duty of prompt and ample relief for the distress in Porto Rico, there is happily not a shade of difference of opinion among the seventy-five millions of our inhabitants. Nor was the free trade remedy, so vehemently recommended, important enough in itself to provoke serious objection or delay. Cynical observers might find indeed a gentle amusement in noting how in the name of humanity the blessings of free trade were invoked by means of a demand for the immediate application of the highest protective tariff known to the history of economics. The very men who denounce it as a Chinese wall are the men who demand its application. They say "Give Porto Rico free trade;" but what their proposal means is "Deprive Porto Rico of free trade, and put her within the barbarous Chinese wall." Their words sound like offering her the liberty of trade with all the world, but mean forbidding her to trade with anybody except the United States.

The importance of the question from an economic point of view has been ludicrously exaggerated on both sides. The original proposal would have in itself done far less harm than its opponents imagined and far less good than its supporters hoped. Yet to the extent of its influence it would have been a step backwards. It would have been the rejection of the modern and scientific colonial method; and the adoption instead of the method which has resulted in the

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most backward, the least productive, and the least prosperous colonies in the world—the method, in a word, of Spain herself. For the Spanish tariff, in fact, made with some little reference to colonial interests, we should merely have substituted our own tariff, made with sole reference to our own interests. A more distinct piece of blacksmith work in economic legislation for a helpless, lonely little island in the mid-Atlantic could not well be imagined. What had poor Porto Rico done, that she should be fenced in from all the old world by an elaborate and highly complicated system of duties upon imports, calculated to protect the myriad varying manufactures and maintain the high wages of this vast new continent; and as little adapted to Porto Rico's simple needs as is a Jurgensen repeater for the uses of a kitchen clock? Why at the same stroke must she be crushed, as she would have been if the Constitution were extended to her, by a system of internal taxation, which we ourselves prefer to regard as highly exceptional, on tobacco, on tobacco dealers, on bank checks, on telegraph and telephone messages, on bills of lading, bills of exchange, leases, mortgages, life insurance, passenger tickets, medicines, legacies, inheritances, mixed flour, and so on, and so on, *ad infinitum*, *ad nauseam*? Did she deserve so badly of us that, even in a hurry, we should do this thing to her in the name of Humanity?

All the English-speaking world, outside the United States Congress perhaps, long since found a more excellent way. It is simplicity itself. It legislates for a community like Porto Rico, with reference to the situation and wants of that community—not with reference to somebody else. It applies to Porto Rico, a system devised for Porto Rico—not one devised for a distant and vastly larger country, with totally different situation and wants. It makes no effort to exploit Porto Rico for the benefit of another country. It does make a studied and scientific effort from the Porto Rico point of view—not from that of temporary Spanish holders of the present stocks of Porto Rican

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products—to see what system will impose the lightest burdens and bring the greatest benefits on Port Rico herself. The result of that conscientious inquiry may be that the very best thing to provide for the wants and promote the prosperity of that little community out in the Atlantic Ocean is to bestow upon them the unmixed boon of the high protective Dingley tariff, devised for the United States of America. If so, give them the Dingley tariff, and give it straight. If, on the other hand, it should be found that a lower and simpler revenue system, better adapted to a community which has practically no manufactures to protect, with freedom to trade on equal terms with all the world, would impose upon them lighter burdens and bring them greater benefits, then give them that. If it should be further found that, following this, such a system of reciprocal rebates as both Cuba and the United States thought mutally advantageous in the late years of Spanish rule, would be useful to Porto Rico, then give them that. But in any case, the starting point should be the needs of Porto Rico herself, intelligently studied and conscientiously met—not the blacksmith's offhand attempt to fit on her head, like a rusty iron pot, an old system made for other needs, other industries, a distant land, and another people.

And beyond and above all, give her the best system for her situation and wants, whether it be our Dingley tariff or some other, because it is the best for her and is therefore our duty; not because it is ours, and therefore under the Constitution of the United States her right. The admission of that ill-omened and unfounded claim would be, at the bar of politics, a colossal blunder; at the bar of patriotism, a colossal crime.

The politics of it need not greatly concern this audience or long detain you.

But the facts are interesting. If Porto Rico, instead of belonging to us, is a part of us, so are the Philippines. Our title to each is exactly the same. So are Guam and

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Samoa and the Sandwich Islands; and so will be Cuba, if she comes, or any other West India island.

First, then, you are proposing to open the ports of the United States directly to the tropical products of the two greatest archipelagoes of the world; and indirectly, through the open door we have pledged in the Philippines, to all the products of all the world! You guarantee directly to the cheap labor of these tropical regions and indirectly but none the less bindingly to the cheap labor of the world, free admission of its products to this continent, in unrestricted competition with our own higher paid labor. And as your whole tariff system is thus plucked up by the roots, you must resort to direct taxation for the expenses of the general Government.

Secondly, as if there were not enough, you have made these tropical laborers citizens—Chinese, half-breeds, pagans and all—and have given them the unquestionable and inalienable right to follow their products across the ocean if they like, flood our labor market, and compete in person on our own soil with our own workmen.

Is that the feast they wish to set before the laboring men of this country? Is that the real inwardness of the Trojan horse pushed forward against our tariff wall, in the name of humanity to suffering Porto Rico? What a programme the wise humanitarians who have been bewitching the world with noble statesmanship at Washington to propose laying before the organized labor of this country as their chosen platform for the approaching Presidential campaign! They need have no fear the intelligent workingmen of America will fail to appreciate the sweet boon they offer.

But if the question thus raised at the bar of politics may seem to some only food for laughter, that at the bar of patriotism is matter for tears. If the Islanders are already citizens, then they are entitled to the future of citizens. If the territory is already an integral part of the United States, then by all our practice and traditions it has the right to admission in States of suitable size and population. Is it

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said we could keep them out as we have kept out sparsely settled New Mexico? How long do you expect to keep even New Mexico out, or Oklahoma, or Arizona? What luck did you have in keeping out others—even Utah—with its bar sinister of the twin relic of barbarism? How long would it take your politicians of the baser sort to combine for the admission of the islands whose electoral votes they had reason to think they could control?

But it is said that Porto Rico deserves admission any way, because we are bound by the volunteered assurance of General Miles that they should have the rights of American citizens. Perhaps; though there is no evidence that he meant more, or that they thought he meant more, than such rights as American citizens everywhere enjoy, even in the District of Columbia,—equal laws, trial by jury, the writ of habeas corpus, local self-government—in a word, the civil rights which the genius of our Government secures to all under our control who are capable of exercising them. If he did mean more, or if they thought he meant more, did that entitle him to anticipate his chief and override in casual military proclamation the supreme law of the land, whose commission he bore? Or did it entitle them to suppose that he could?

But Porto Rico received the irresistible army of General Miles so handsomely, and is so unfortunate and so little! Reasons all for consideration, certainly; for care, for generosity:—but not for starting the avalanche, on the theory that after it has got under only a little headway we can still stop it if we want to. Who thinks he can lay his hand on the rugged edge of Muir Glacier and compel it to advance no further? Who believes that we can admit this little half-Spanish, half-negro waif from the mid-Atlantic, a third of the way over to Africa, and then reject nearer and more valuable islands when they come? Behind Porto Rico is Cuba, and behind Cuba are all the other West Indies; and the famous law of political gravitation which John Quincy Adams prophetically

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announced three-quarters of a century ago will then be acting on them with ever increasing force. And behind them—no, ahead of them—abreast of Porto Rico itself, stand the Philippines!

Regard, I beg of you, in the calm white light that befits these cloistered retreats of sober thought, the degredation of the Republic thus coolly contemplated by the men who assure us we have no possessions whose people are not entitled under our Constitution to citizenship and ultimately to statehood! The republican institutions we have been trained in constitute a system only likely to endure among a people of high virtue and high intelligence. Such are its complications and checks and balances and interdependencies, which tax the intelligence, the patience, and the virtue of the highest Caucasian development, that it is obviously a system absolutely unworkable by a group of tropical and Oriental races, more or less hostile to each other, whose highest type is a Chinese and Malay half-breed, and among whom millions, a majority possibly, are far below the level of the pure Malay.

Before the advent of the United States the history of the world's efforts at republicanism was a monotonous record of failure. Your very schoolboys are taught the reason. It was because the average of intelligence and morality was too low; because they lacked the self-restrained, self-governing quality developed in the Anglo-Saxon bone and fibre through all the centuries since Runnymede; because they grew unwieldy and lost cohesion by reason of unrelated territory, alien races and languages, and inevitable territorial and climatic conflicts of interest.

We all remember Mr. Lincoln's words, "This Government cannot permanently endure half-slave, half-free." Who disputes it now? Well, then, can it endure half-civilized and enlightened, half-barbarous and pagan; half-white, half-black, brown, yellow, and mixed; half-northern and Western, half-tropical and Oriental; one-half a homogeneous continent, the other half in myriads of islands,

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scattered half way around the globe, but all eager to participate in ruling this continent, which our fathers with fire and sword redeemed from just such barbarism and subdued to the uses of the highest civilization?

Surely to an audience of scholars and patriots like this, not one word need be added as a summons to the high resolve that you will neither shame the Republic by shirking the duty its own victory entails, nor despoil the Republic by abandoning its rightful possessions, nor degrade the Republic by admission of unfit elements to its Union; but that you will honor it, enrich it, ennoble it, by doing your utmost to make the administration of these possessions worthy of the Nation that Washington founded and Lincoln preserved.

May I not go further and vouch for you, as Californians, that the faith of the fathers has not forsaken the sons—that you still believe in the possibilities of the good land the Lord has given you and mean to work them out; that you know what hour the national clock has struck and are not mistaking this for the eighteenth century; that you will bid the men who have made that mistake—the men of little faith, the shirkers, the doubters, the carpers, the grumblers begone, like Diogenes, to their tubs—aye, better his instruction, and require these, his followers, to get out of your light. For, lo! yet another century is upon you, before which even the marvels of the nineteenth are to grow pale. As of old, light breaks from the East, but now also, for you, from the farther East. It circles the world in both directions, like the flag it is newly gilding now with its tropic beams. The dawn of the twentieth century bursts upon you without needing to cross the Sierras, and bathes at once in its golden splendors, with simultaneous effulgence, the Narrows of Sandy Hook and the peerless portals of the Golden Gate.

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INTRODUCTORY PROPOSITIONS IN THE STUDY OF POLITICS.*

By BERNARD MOSES.

A full discussion of politics, or civil government, embracing all the facts pertaining to the subject, is divided, according to the character of the topic, into two parts. One part of the discussion comprises all the facts that refer to the origin and nature of states, the forms of their organization, and the methods of their procedure. Here everything must be considered which relates to what the state is, how it has become what it is, and what are its processes in doing its work. The other part of the discussion deals with the facts which relate to the policy of states, or with the practical purposes to which its activity ought to be directed. In studying the facts of civil government belonging to the first class, we discover the conditions under which the state has come into existence, what the state is, how it is organized, the amount and character of its power, and how it holds and exercises this power. In studying the facts of the second classs, we deal with the practieal problems of what the state ought to do. The study in the first case is the work of the scientific investigator of political phenomena for the purpose of forming a science of civil government. The inquiries in the second case are the work of the practical legislator or administrator, who is seeking by means of the state to accomplish certain

* A paper read at a meeting of the Southern California Teachers' Association, December 22, 1899.

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practical results. The investigations in the first case lead to the formation of a body of generalized and systematic knowledge, which we call a science. The inquiries and consequent action in the second case lead to the formation of a body of laws and ordinances for the direction and control of public affairs.

The Nation.—The fact of the existence of several nations in the world is almost as apparent as the existence of the human race itself. Frenchmen learn very early that they are not Englishmen; the Japanese, that they are not Russians; and the Spaniards, that they are not Germans. Our tradition, our love of country, and our reading in history tend to keep clear in our minds the fact that the members of our nation constitute a large group by themselves, and that they are in some respects separate and distinct from other nations. The nation, which is thus a prominent object of the thought of civilized men, may be defined as a large independent group of persons, possessing a definite territory, of whom a certain number are organized into a body known as a state, which holds and exercises supreme governmental power over all members of the group.

1. There must be a large number of persons constituting a group that differs in certain particulars from other similar groups. It is clear that a nation must consist of more than five persons, and it is also clear that the number may be less than twenty millions. Yet between five persons and twenty millions of persons there is no number that is large enough to constitute a nation, while the next smaller number would be inadequate for this purpose. A definite numerical statement need not be sought for here; we need not inquire what is the lowest number of inhabitants of a given territory, who may be considered as a nation. It is necessary to know only that a certain group of persons has been generally held to be an independent society.

2. There must be within this group a certain number of persons holding and exercising, over the members of the

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group, powers that are not limited by the decrees of any other person or body of persons. These persons are such as have political rights; in the United States they are those who have the power to vote. As organized for the purpose of government, the holders of political rights constitute the state. Where women and children have no right to vote or hold office, they are members of the nation, but not members of that group within the nation, which wields the power of the nation; they are not members of the state.

3. There must be a definite territory, over which the state, or the body wielding the power of the nation, exercises supreme authority, and the persons living within the limits of this territory must obey the commands and the decrees issued under this authority.

The State.—The state is that part of the nation which is organized for the purposes of government. It makes and executes the laws under which the nation is governed; and it may also be described as the body that wields the power of the nation. It does not exist apart from the nation, but its existence presumes the existence of the nation. The members of the state are all members of the nation, but there are members of the nation who are not members of the state. Minor children, women not allowed to vote, and other persons not enjoying political rights, are members of the nation but not members of the the state. Within the state are included all the institutions and legal associations employed in the government of the of the nation, whether the purpose of these institutions is legislative, judicial, or executive. The court of the justice of the peace, the body or series of bodies empowered to amend the constitution, and all other legally constituted holders of political power are alike parts of the state.

A People.—To avoid vagueness in political thought we need also to attach a definite meaning to the term people. A people may, therefore, be defined as a large community of persons whose common language and social institutions

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indicate either a common descent or long residence under common circumstances, and whose language, sentiments, and institutions distinguish it from other similar divisions of the human race. It is often the product of growth, as the family or clan is the product of growth; and there is no necessary connection between the extent of a people and the extent of a nation. The extent of a nation is determined by the extent of the jurisdiction of its power as expressed through the state. The nation may embrace a whole people, as in the case of the Japanese nation, or a part of a people, as in the case of the German nation, or parts of several peoples, as in the case of the Swiss nation. In political discussion, questions concerning peoples are not especially conspicuous; the nation is the largest group coming particularly under consideration; for it is the largest group having an organization formed for action.*

The Nation as an Independent Political Society.—When we call the nation an independent political society, we mean that there is no other society or person having the right to demand from it obedience, or to control its action. We call it independent because it has no superior. The power which it exercises through the state organized within its limits is not legally curtailed. Other nations may object to a course of conduct which it has determined to pursue; but their objections cannot be expressed except in the form of protests or by armed interference. As an independent political society it is to be distinguished from a subordinate political society. A subordinate political society has often many of the qualities of an independent society, but it is subject to the authority of a superior. The best example of a subordinate political society is one of the great subdivisions of a nation with a federal form of government, as a State in the United States. The inhabitants of Ohio have

*The word people has been used in a great variety of senses, and, in making quotations, one is obliged to take it with the sense given to it by the writer. At the end of the fifth chapter a quotation is made from Bancroft's "History of the United States," in which it is said that the Declaration of Independence was "the announcement of the birth of a people."

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a political organization designed to perform many of the functions which a national state is created to perform. Through their political organization they can make and execute laws concerning all matters which do not bring them into conflict with the laws of the national state. Their power is limited by the power of the federal state. They constitute a political society subordinate to an independent society; and their political organization, or government, is a subordinate government. Their superior is the independent political society of which they are a part.

The Departments of State.—Since the nation never acts except through its political organization, the state, and since the state presupposes the nation, it is customary and proper to speak of the nation's activity, whether in internal or foreign affairs, as the activity of the state. It is the state that makes and executes the laws; it is the state that declares war and makes peace; and it is the state that performs all public work that is done in behalf of the nation. But when we call to mind the many kinds of public work to be done in a great nation, it becomes evident that the state must be an organization with many branches, or departments. The number of departments is determined by the amount and variety of work to be done by the state. In the simple forms of society, like the tribe or primitive community, there are only a few things which all the members of the tribe or community are interested in having done; and these things may very well be undertaken by the chief of the tribe or a single person appointed by the community. But after the tribe has increased and the community has joined other communities, the new society has more common interests that need to be promoted and guarded; and it is found that the work of governing can be most effectively performed by instituting a division of employments. The simple state in this way grows to be a state of two or more departments. The difference between the primitive state and the state of a great modern nation is that one is extremely simple, while the other is extremely

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complex. The one has few offices and little public work; the other has many offices, in many departments, and much public work; and the progress from the simple to the complex state is by a process of division of labor, on the one hand, and, on the other hand, by an increase in the amount of work to be done. The existence of several departments is evidence that a division of labor has been carried out in the state in question.

Territorial Distribution of Government Work.—The distribution of the work of governing which is most frequently noted is that made among the legislative, judicial, and executive departments. Another distribution is that made among the several political organizations, the central government performing some of the work, the provincial or state organization another part, and the communal or municipal organization still another part. The legislative work in a modern state is thus of several grades; the laws pertaining to each of these grades are distinguished by the territorial extent of their application, except, where, by design, they are made to apply specially. Laws of the first grade are national laws; they are valid everywhere within the limits of the national territory. Laws of the second grade are provincial laws, or laws pertaining to the larger subdivisions of the nation; they are valid within the province or canton or state in which they are enacted. Laws of the third grade are municipal laws; they are valid in the city, town, or commune for which they were designed. In the United States these laws of various grades correspond with the laws passed by the federal government, the state governments, and the town or city or county governments.

Under this distribution the work of legislation is performed in part by the bodies that make the federal constitution, in part by the federal congress, in part by the state legislatures, and in part by the councils or supervisors of towns and counties. There are also several grades of executive and judicial officers: those belonging to

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the nation as a unit, and those belonging to the several grades of subordinate political societies. And all these officers, of whatever grade, may be considered as deriving the power they hold and exercise from the holders of the supreme power in the state. This distribution of power is a matter of convenience rather than an absolute necessity. Like the distribution of power among departments, this territorial distribution represents also a division of labor in the business of government, and is carried out in different degrees of completeness in different states. In states approximating the type of the absolute monarchy, it is less fully carried out than in a representative federal republic.

Constitutional and Statute Laws.—The laws of each of the several grades already mentioned, or the laws pertaining to each of the several political divisions, are of two kinds. The first of these are organic, or constitutional, laws; the second are the laws of the statutes, or administrative laws.

1. A general definition of constitutional law or of a constitution is that given by Aristotle, when he calls it "an organization of offices in a state." (Politics, IV. I.) Constitutional, or organic, laws may be more definitely described by a statement of what they do. A constitution, containing a number of organic provisions, or constitutional laws "prescribes the order of succession to the throne; or, in a republic, the mode of electing a president. It enumerates the prerogatives of the king, or other chief magistrate. It regulates the composition of the council of state, and of the upper and lower houses of the assembly, when the assembly is thus divided; the mode in which a seat is acquired in the upper house, whether by succession or nomination, or by tenure of office; the mode of electing the members of the house of representatives; the powers and privileges of the assembly as a whole, and of the individuals who compose it; and the machinery of law-making. It deals also with the ministers, their responsibility and their respective spheres of action; the government offices and

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their organization; the armed forces of the state, their control and the mode in which they are recruited; the relation, if any, between church and state; the judges and their immunities; local self-government; and the relations between the mother country and its colonial dependencies." (Holland, Elements of Jurisprudence.) This description of a constitution is not complete, yet it indicates that a state is organized through its constitution. It suggests the fact, moreover, that the subordinate political societies, as they are organized for the purposes of government, have also constitutions, or organic laws which serve the purposes of constitutions. The constitution of a state in the United States or of a canton in Switzerland has the general characteristics of the federal constitution. In the case of Canada, the constitution, or organic law, is in the form of an act of the British Parliament. In the case of a municipality, the charter stands in the place, and serves the purposes, of a constitution; and in the United States the city charter is formally an act of the state legislature.

2. The second form of the law is that of the statutes and the ordinances. Laws of this kind aim not to organize the state, but to express and help to achieve the practical purposes of the state in the real business of governing.

These two kinds of laws are not only different in character, but generally they are made by different bodies. The constitutional law, or the organic law, of a political society, is, however, sometimes made by the same body that makes the statute law. This is the case in England, as it regards the national law. The English Parliament makes the constitutional laws which prescribe the form of the state, fix the succession to the throne, or establish the mode of electing the members of the lower house of the legislature. At the same time the parliament also makes the statute laws which determine the rates of taxation, impose penalties for crime, or appropriate the revenues for the purposes of government. But in most instances the constitutional law is made by a body or by a combination

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of bodies different from the body or bodies that make the administrative, or statute, laws. What this body is, or what these bodies are, may be seen by referring to that section of a written constitution which describes the mode of amending the constitution; for the power to amend is the power to make a new constitution. The body or union of bodies that may amend the organic law is the body that makes it. The bodies that make the administrative, or statute, law are usually bodies that exercise power derived from the makers of the constitutional, or organic, law.

The Supreme Law and its Makers.—Although there are different kinds of laws and several grades of law-making bodies, it is evident that one body or one combination of bodies must be supreme, and that the law proceeding from this body or combination of bodies must be superior to all other laws. If this were not the case, the various authorities might issue laws in direct conflict with one another, and there would be no legal means of setting aside the conflict. A nation thus appears as an independent society, or a group of persons, subdivided for purposes of government into subordinate groups, or societies; and the subdivisions of the first grade are further divided into smaller groups. In the case of the United States, the whole body of the inhabitants is divided into groups living in states, and the inhabitants of the several states are in turn divided into groups living in towns or counties. These divisions of the population correspond, therefore, with divisions of the national territory. Order is preserved throughout the nation by a general recognition of the different grades of laws, and by an acceptance of the authority of each within its sphere, from the supreme law of the national constitution down through the laws of the several grades to the local ordinances of the counties, cities, and towns. In the United States, the bodies which make the federal or national constitution cover a certain field of legislation, and the bodies which make the state constitution may not encroach upon this field; and moreover, the

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body which makes the charter of a city may not encroach upon the legislative field occupied by the makers of a state constitution. The highest authority in the nation is therefore, vested in the body or union of bodies having power to make or to amend the national constitution; and the decisions or decrees of this body or this union of bodies, in legal form, constitute the supreme law of the nation. And this supreme law may not be limited or modified, except by the body which made it. It is thus the expression of the highest earthly power known.

In view of the unrivalled authority and dignity of the supreme law of a nation, it is important to know the origin of this law; for in the body that makes it, we discover the legal source of all the power exercised in the state. The makers of the supreme law stand at the head of the hierarchy of all the power-exercising bodies or offices which make up the political organization of a nation. Through this law, which is the national constitution, they indicate the amount and kind of power which subordinate authorities shall exercise. In the United States, the makers of the national constitution have conferred upon the President certain powers; upon the Congress, certain other powers; and upon the Supreme Court, still other powers. The three departments of the national government here indicated exercise powers delegated to them by the makers of the national constitution. No one of them has derived its powers from another, but all have derived them from a common source, namely, from the makers of the supreme law, or the national constitution. The makers of the constitution of the United States have, moreover, disposed of all the powers belonging to an independent state. They have given some, as we have seen, to the national executive, some to the federal legislature, and some to the federal court. Whatever political powers the nation possessed that have not been distributed among the departments of the federal government have been, by an expressed decree in the constitution itself, "reserved to the States respectively,

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or to the people." (Amendment X.) And the makers of the constitution might have "reserved" a larger or a smaller amount of power to the states. If, therefore, at the present time, a municipality exercises certain specified powers, it exercises them by virtue of the fact that the power to grant a municipal charter was one of the powers "reserved" by the national constitution to the states; and that the state in question has used this power and granted a charter to the municipality, under which the specified powers are exercised. Thus the existence of power at any point in the governmental system of the United States is due directly or indirectly to the determination of the makers of the supreme law, who are competent to modify the form or the function of any of the institutions of the state. There is, in fact, theoretically no limit to the changes in the organization of the state or in the distribution of power that may be effected by the makers of the supreme law.

In England the makers of the supreme law are the body that also makes the statute law of the kingdom, namely, the Parliament, embracing the House of Commons, the House of Lords, and the Crown. But in the United States the makers of the supreme law have no other function than that of making this law. They are defined in Article V of the federal constitution, and consist in the Congress or a "convention for proposing amendments," and the legislatures of the several states, or conventions in the several states. The amendments proposed by the Congress or by the convention for proposing amendments become valid as parts of the constitution when "ratified by the legislatures of three-fourths of the several States, or by conventions in three-fourths thereof;" and it devolves upon Congress to determine which means of proposing amendments and which means of ratification shall be employed. In France, the supreme law is made by the National Assembly. This assembly is composed of the members of the Chamber of Deputies and the Senate meeting in joint session. As in these cases, so in every nation, there is some person or

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some body of persons holding the power to make a decree or a law that will set aside or annul any existing law or decree; and that may not be called in question by any other person or combination of persons within the nation. In a constitutional state this body is the maker of the constitution. In an absolute principality or empire, power equivalent to this is held by the prince or emperor. This is the point in the organization of a state at which absolute authority appears. Somewhere in every state there is, therefore, a person or body of persons clothed with practically absolute authority. It is the prince in the absolute monarchy; it is the maker of the supreme constitutional law in a constitutional state.

The Supreme Power in a Nation.—The fact that in the political organization of every nation there is a person or a body of persons holding power that is theoretically unlimited, indicates that in one particular at least all states are alike. They are alike in that in some part of each there is vested an authority which is not legally curtailed by any other authority. They differ in that this authority in some cases is vested in one man; in other instances in a limited assembly of men; and in still other instances in a union of several assemblies, or in the body of the mature male citizens. But, however held, the authority in all cases is the same. The authority of the Czar, supposing him to be an absolute prince, is not greater than that held by the makers of the supreme law in England, France, the United States, or in any other independent state. One state may have a larger army or a more powerful navy than another, but its independence is not theoretically more complete, or its nominal authority more unlimited. From this point of view, all states appear to have the same amount of power, and it is only with reference to the practical exercise of this power that they differ. Denmark has fewer warships than England, and an ineffective army as compared with the army of the German Empire, yet the Danish state enjoys the same degree of independence as the

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Empire. There is no legally constituted authority over either. Neither is under any legal obligation to act in accordance with the wishes of the other. Each determines freely its own line of action, considering only its own wishes and the chances of war with some state offended by its action. This is true not only of Denmark and the German Empire, but of all states of acknowledged independence. Thus the power of the makers of the supreme law in the United States is not less absolute than that of the Czar of Russia. The difference between these two great states, observed from this point of view, consists in the fact that, in the one case, the supreme power is vested in one man; in the other case it is vested in a complicated union of political bodies. This supreme, unlimited power is called sovereignty, and the person or body of persons holding and exercising it is called sovereign. What the sovereign in Russia may do, that the sovereign in the United States may do. It is thought that the wishes of the bulk of the nation are more likely to be respected in the United States than in Russia; and this thought rests on the knowledge that in Russia the supreme power is in the hands of one man, while in the United States it is vested in a union of assemblies that involve, either directly or indirectly, a large part of the population of the country; and it is expected that the large number of persons thus involved will be disposed to use their powerful influence to direct the action of the state in the line of their collective interests.

The Electors and the Sovereign.—While it is recognized that the sovereign here described is the supreme legal authority in the state, it is also recognized that back of the sovereign, in a constitutional state, there is a body of voters, called by Professor Dicey the "political sovereign," on whom the several members of the legal sovereign ultimately depend. This body is composed of the electors whose votes determine who shall belong to the supreme law-making body. The electors set up the legal sovereign,

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but they have no power to make a law or issue a decree. They may express their will with respect to persons, but their will as to the form and content of laws has no legal expression, except through the organized body which they create. In the British Empire "the courts will take no notice of the will of the electors. The judges know nothing about any will of the people except as far as that will is expressed by an Act of Parliament, and would never suffer the validity of a statute to be questioned on the ground of its having been passed or being kept alive in opposition to the wishes of the electors." (Dicey, The Law of the Constitution, 1889, 70.) "And no rule, whether of morality or of law, which controvenes an Act of Parliament, binds any court throughout the realm." (Dicey, 353.) This is the attitude of the courts in every civilized nation. It is certainly important to keep in mind the powers of the electors as a political body, but their qualities are so essentially different from those of the legal sovereign that it is likely to add confusion to our statements to call them any kind of a sovereign. With respect to the utterances of the state in whatever form, their power is unquestionably great, but it can be exerted only indirectly. While it may be "the essence of representative government," that the law-making bodies should represent or give effect to the will of the electoral body (Dicey, 353), still, if in any act of legislation the law-making body fails to do this, the will of the law-making body as represented in the law has complete validity; and there is in such an act no violation of the principle of political representation.

In the United States, or in any other constitutional state, the body that makes the constitution is likewise dependent upon the electors who have constituted it; but, at the same time, in determining what the form and doctrine of the constitution shall be, the electors exert only an indirect influence; if the actual law-makers do not meet the wishes of the electors, others may be put in their places on a later occasion, but these, like the first, will hold the

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full power to determine what the law shall be. They may concede as much or as little to the wishes of the electors as they see fit. They, or successors like them, alone have the power to act in making the supreme law.

Acquiring the Supreme Power.—If we inquire why in any given nation the sovereign is composed as we actually find it, we raise the question of the process by which those who hold the supreme power acquire it. Hobbes attempted to answer this question by affirming that "the attaining to this sovereign power is by two ways. One, by natural force; as when a man maketh his children to submit themselves and their children to his government, as being able to destroy them if they refuse; or by war subdueth his enemies to his will, giving them their lives on that condition. The other is when men agree amongst themselves to submit to some man, or assembly of men, voluntarily, on confidence to be protected by him against all others." (Leviathan, or the Matter, Forme, and Power of a Commonwealth, Ecclesiasticall and Civill. London, 1651, 88.)

By the second way, Hobbes conceived a sovereign "to be instituted when a multitude of men do agree, and covenant, every one with every one, that to whatsoever man, or assembly of men, shall be given by the major part the right to present the person of them all (that is to say, to be their representative), every one, as well he that voted for it as he that voted against it, shall authorize all the actions and judgments of that man, or assembly of men, in the same manner as if they were his own, to the end to live peaceably amongst themselves and be protected against other men." (Leviathan, 88.) This is a fundamental statement of the doctrine of the Social Contract, as a theory to explain the origin of supreme power in a state, or the origin of the state itself. The theory of the Social Contract is at present, however, not generally accepted, as it is seen not to be in harmony with historical facts. These facts seem rather to confirm the first method, in so far as this

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involves the thought that the holders of supreme power have it by assumption. Clearly the men who first exercised supreme power in the United States had not this power conferred upon them by some other body. They assumed it. Dr. Francia became the absolute ruler of Paraguay not through any agreement on the part of those who became his subjects. He assumed the power which he exercised, and it is not denied that it was supreme. The several Spanish-American republics are the holders of supreme power as the result of the assumption of such power by certain bodies of persons at the time of the war for Spanish-American independence; and these bodies, whatever they were, have passed it on to the present sovereign bodies in the several states.

We cannot trace the history of any nation, or any large part of a nation, back to a time when it did not recognize some public authority. In the primitive tribe the power of the chief is essentially political power; it is the antecedent of the power exercised by a modern state. Political power, held in some form, is a feature of the earliest phases of society. There is no historical report of a large body of persons, who were not under some public authority, coming together to institute a state and to vest the supreme power in a single person or in an assembly. The new states that have come into existence in historical times have been formed either by the union of tribes, or small independent societies already organized, or by revolutionary action. Revolutionary action as here conceived consists in a person or a number of persons assuming, without the authorization of law, and exercising supreme power over a part or the whole of a nation in defiance of those who had previously held and exercised this power over the whole nation. In all such cases a part of the persons counted in the revolting population assume the power, and, if the revolt leads to independence, this act of assumption is the beginning of the power of the new state, and the origin of the sovereign body.

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Nation-Making.—In the formation and growth of nations two processes are observed. By the first, small social bodies are drawn together and consolidated into larger units; by the second, parts of the larger units are thrown off and become independent societies. The first process shows us families uniting or growing into tribes, and tribes expanding and uniting to form nations. The union of tribes is accomplished by various methods: sometimes it is by friendly alliances, but oftener it is by one tribe using its power to overcome others and bring them into subjection. In case of colonial migration to a region not hitherto occupied by civilized inhabitants, the individual settlements are drawn together for the purposes of a more advantageous trade, and for military encroachment or defense. This is the process of social integration, and the force which underlies it may be called the centripetal force in social growth. In the second process we discover a phase of social disintegration. Parts of nations, as if under the influence of a centrifugal force, tend to fly off and move forward on independent paths. The new nations that have come into existence in America, growing out of colonies established by European nations, illustrate this movement. The inhabitants of these nations were at first subject to the holders of the supreme power in England, Spain, and Portugal. Their achievement of independence marks the partial disintegration of those nations and the establishment of new nations. It thus happens that under the centripetal force in society, which produces, in the course of social growth, larger and larger national aggregates, there appears at a certain stage a condition of affairs in which the centrifugal, or disintegrating, forces are more powerful than the forces that are exerted in the opposite direction; and the new independent societies that then come into existence become, in turn, influenced in their development by the contending forces that have affected the life of the older nations. It is clear, however, that with the extension of the means of rapid communication the mastery of the

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disintegrating forces is put off, making possible the existence of larger political aggregates than were known in the earlier centuries.

The Agents of the Sovereign.—While the state includes all persons in the nation enjoying political rights, and all the organizations or institutions designed to perform the work of governing, the distinction between the holders of supreme power and the holders of subordinate or delegated power must be emphasized. The holders of supreme power act irrespective of any prescribed limits; the holders of delegated powers, on the other hand, act within prescribed limits; and the limits are fixed by the holders of supreme power, or the sovereign. It thus appears that all the officers or institutions below the sovereign are in some sense agents of the sovereign. They do what the sovereign has power to do, and what he orders or permits them to do. But, as in every state there is a more or less extensive gradation of offices or institutions, illustrated in the United States by federal, state, and local offices or institutions, it follows that some institutions are the direct agents of the sovereign, while others, of the lower grades, are only indirect agents. But above all agents of whatever grade the sovereign holds the final authority which may not be violated. In the United States the President, the Congress, and the Supreme Court are direct agents of the sovereign. All the lower officers or institutions, which are not established by the provisions of the federal constitution, are indirectly agents of the sovereign.

Local Governments.—The various subordinate political societies in a nation, such as the state, the town, and the county in the United States, are the field of local government. They are of several grades; and, when considered with reference to the historical growth of the nation, they indicate, in the order of their increasing extent, the successive stages in this growth. They mark the stages of expanding political dominion. The towns, counties, or communes point to a state of society when bodies like these

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were independent. This was the state of affairs in Greece, when "the only source of supreme authority to which a Greek felt respect and attachment was to be sought within the walls of his own city," and "when the relation between one city and another was an international relation, not a relation subsisting between members of a common political aggregate." (Grote, History of Greece, New York, 1864, II, 257.) The early history of many nations is, in like manner, marked by the independence of small communities, and the union of two or more of these is the sign of a movement forward towards the formation of great nations like those of modern times. The first result of this union is a body larger than the town or city, which asserts its independence as a petty principality or a little republic. When the larger nation is formed these intermediate communities appear as provinces, or cantons, or as states in a federal union. From the point of view of this process of growth, the nation appears as "a fusion and expansion of a series of units, which were originally little sovereignties, and which in their new relations as departments, or counties, or municipalities, retain portions of their old sovereign powers." (Crane and Moses, Politics, New York, 1884, 63.) But because the power of local governments is in some sense a survival of powers once held by small independent political bodies, it is not to be thought that this power constitutes a deduction from the supreme power of the sovereign in the state of which they are now a part. The existing sovereign permits the exercise of powers by subordinate political entities, and "what the sovereign permits, he commands;" and in this act is implied the power to prohibit. The powers exercised by local governments are not to be conceived as subtracted from that of the sovereign, but as delegated by the sovereign.

But this process of growth has not been strictly realized in the formation of all existing nations. Colonies planted and governed under the strong hand of a great state may

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become independent in some cases, although no part of them has at any time previously exercised power independently. The nations on the American continent that have grown up from colonies of Europeans are of this class. Except in the matter of independence they have, however, followed the historic process of growth. Individual settlements were united into larger groups, and the larger groups, the "Colonies" of the English, were brought together and organized as a nation.

Similarity of Governments.—Among the states of Europe and America there is a certain similarity in the general features of governmental organization. Some of the causes of this similarity are discovered in the essential likeness of the popular mind in the different nations belonging to the race; in the existence of a common instinctive tradition in all parts of the race; and in imitation made possible by a common intellectual inheritance. By these causes earlier forms are made to survive, and, according to Professor Freeman, "The first glimpse which we can get of the forms of government in the early days of kindred nations shows them to have been wonderfully like one another. Alike among the old Greeks, the old Italians, and the old Germans, there was a *king* or chief with limited power, there was a smaller *council* of nobles or of old men, and a general *assembly* of the whole people. Such was the old constitution of England, out of which its present constitution has grown step by step. But there is no reason to think that this was at all peculiar to England, or even peculiar to those nations who are most nearly akin to the English. There is every reason to believe that this form of government, in which every man had a place, though some had a greater place than others, was really one of the possessions which we have in common with the whole Aryan family." (General Sketch of History, 6; Comparative Politics, 65–68.) In this primitive form we have the type and model for later Aryan governments. By imitation and the force of the political instinct, its essential

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features have survived and appear in the principal governments of Europe and America. Not only is this form common to the several branches of the race in the early phases of its history, but it is also the form which the nations have labored to re-establish whenever it has been set aside by any foreign influence. Cromwell and his followers set aside the king and the lords, and proposed a government in which these elements were omitted. This was doing violence to the instinctive traditions of the nation, and it became early apparent that no government could survive which did not involve the essentials of the historic form. The French on three occasions have set up a republic, and, at each time, with only a single legislative body in the general government, but in each case they have returned to a form approved by our political instinct. The church at various times and in many nations has demanded political recognition through a separate house of legislation; but recent political growth has tended to eliminate the third house, and bring the several governments concerned into harmony with the primitive model. (See Crane and Moses, Politics, Chapter VII, on "Instinct as a Factor of Political Organization.")

Specific Points of Similarity.—1. The recognition of a single person as the head of the state is common to all the nations within our view. Switzerland, apparently furnishing an exception, has set up an executive authority consisting of a federal council composed of seven members; yet in the practical working of the government one member of the council is recognized as the "President of the Confederation," and is given this title in the federal constitution. The provisions of the Swiss federal constitution bearing on this point are as follows:

"Article 95. The supreme direction and executive authority of the Confederation is exercised by a federal council composed of seven members.

"Article 98. The federal council is presided over by the President of the Confederation. There is a Vice-President.

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"The President of the Confederation and the Vice-President of the Federal Council are chosen for one year by the Federal Assembly from among the members of the council."

Most of the powers usually performed by the chief executive here devolve upon the federal council. In Article 102 the powers and duties of the federal council are enumerated.

The heads of the states in different nations differ among themselves chiefly with respect to the amount of power exercised, the mode of attaining power, the term of holding it, and the social prestige of the person acting in this capacity. This may be illustrated by a single comparison. The President of the United States has more effective power in the affairs of government than the King or Queen of England, but his social prestige is relatively insignificant. He attains his power by the vote of the electors, instead of by inheritance; he holds it for a brief and definite term, while the king holds it for the portion of his life that remains after his accession.

2. The head of each of the states is advised on the several parts of his executive work by a body of persons, each of whom is supposed to be an expert in the business of the department to which he is assigned. These officers are sometimes called ministers, as in England, and sometimes secretaries, as in the United States. Collectively they are known as the cabinet or the ministry.

3. All the states involve legislatures composed of two houses, which suggest the two bodies of the primitive Aryan government, or the council of old men and the assembly of the people.

4. Respecting the power and functions of the military organization as a branch of the state, all nations hold essentially the same ideas. The army of one nation is like the army of another nation. The nations differ widely, however, with respect to the extent to which it is desirable to apply the power of the army and the principles of its organization in the business of governing.

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Recent Political Imitation.—In recent times the states of Europe and America have imitated two conspicuous models. These models are the constitutional kingdom of England and the federal republic of the United States.

1. Nearly all of the European states are now organized in accordance with a plan wrought out in the political development of England. The list of constitutional kingdoms that have imitated Great Britain in their organization embraces Belgium, Denmark, Greece, Hungary, Italy, Netherlands, Portugal, Prussia, Roumania, Servia, Spain, Sweden, and Norway. Austria and Germany are constitutional empires, and in certain phases of their organization and procedure have followed the English model. France, at different periods of her history, has been a constitutional kingdom, carrying out more or less fully the principles of the English constitution. The English state has become, in some sense, the pattern for the constitutional development of other states, through the early assertion and consistent maintenance by the English of the principles of political liberty; through the influence of Montesquieu, who made a statement of the English system a conspicuous part of the literature of political theory; and through the enlightened prosperity that has generally attended English rule.

2. After the constitutional kingdom of England, no state has been more extensively used as a model than the federal republic of the United States. All the independent states established on the American continent have been organized as federal republics during some period of their history, and this in spite of the fact that they were under an absolute and centralized government while they were colonies of Spain and Portugal. Moreover, in some cases, the inhabitants of districts which became the territory of states, had had previously, as communities, no political life of their own. The whole territory of the federation in some instances had been subject to a strong centralized rule. These facts indicate that the appearance of the

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federal organization, in the face of Spanish colonial traditions and practices, must be due to some powerful influence not revealed in the history of the colonies. This influence is found in the conditions of the United States, which made the federal form of government appear worthy of imitation. The inhabitants of Mexico and South America were willing to accept federalism because it was something new in the sphere of governmental organization, and had no objectionable record standing against it. They believed that it promised strength at the center of the state, and liberty in local affairs, and thus made impossible the arbitrary oppression and unjust restrictions under which they had suffered. They saw that the English colonists had won their struggle for liberty, and, under a federal government, had entered upon a brilliant career of national prosperity. In the war for the emancipation of Spanish America, they believed they were repeating the programme of the English colonists; and the establishment of federal governments was thought of as a part of that programme.

The Constitutional Kingdom and the Federal Republic.—From the preceding statements it appears that the constitutional kingdom and the federal republic are the two especially prominent forms of government among the western nations. The former has been preferred by the people of modern Europe, the latter by the people of America. The inhabitants of North and South America have been, to a large extent, in agreement as to the excellences of the federal form of government. For three hundred years the Spanish colonies were under a strongly centralized rule. This experience created a powerful instinctive tradition in favor of centralization; and federalism, as the opposite extreme, has been the aim of those who have consciously revolted against the tradition. But the advocates of federalism in the Spanish-American countries have been obliged constantly to contend against the influence of this tradition.

Considered with reference to the growth of nations by

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the drawing together of small political units, the existence of the federation indicates that a certain stage in the process of this growth has been reached; and that it is proposed by constitutional provisions to make permanent the relations that have come to exist between the minor political units. It sometimes happens that the inhabitants of a territory, that has been dominated by a centralized government, throw off the authority of their ancient rulers and set up a federal republic. This movement is illustrated by the early history of the Argentine Republic. The territory formerly under the Viceroy of Buenos Ayres was carved up into States of the Argentine federation. In a case like this, the establishment of a federal government appears as a means of giving local self-government to the inhabitants of outlying distlicts. Federations formed in this way are, however, exceptional. They are conspicuous only on American territory that was formerly under Spanish rule. The normal federation is composed of political entities that had an individual life before they were brought into the federal union. In fact, Arosemena affirms that this is one of the distinctive charactertstics of a federal government. The other he finds to be, "that the sectional government be maintained independent of the national and common government, both in its formation and in its development." (Estudies Constitucionales, I, 199.) Before the adoption of the federal constitution of Switzerland, in 1848, the Swiss cantons were almost completely independent, and the bonds that held them together in the old Swiss Confederation were not greatly different from the alliances that are formed between independent or sovereign, states. The Colonies that were joined to form the federation of the United States were very loosely bound together before the adoption of the federal constitution; and in this condition each had had an independent political life.

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PHILOSOPHY AND EARLY EDUCATION IN GREECE.*

By Ernest Carroll Moore.

To determine man's place in the universe is the problem of philosophy. To help him to reach and fill that place is the task of education. Philosophy is prevision; education is accomplishment. They are coördinate functions of human activity which mutually determine each other. The one is theory—knowledge in statement; the other is practice—knowledge in use. As long as early man could live the easy life of nature's ministration, knowledge could not exist; for it is born of struggle, comes only when it is needed, exists to impart control. It is never a luxury. Its highest as well as its lowest forms are rooted in the daily needs of men. They are not fixed but always functional. The world in which we live is a growing world; the situations which confront the human unit are ever changing; the plans, the formulations which help men to master them are peculiar to their times and places: the end, a final frigid truth, is not yet nor can be to any form of knowledge. It is ever a variable, and human action is its function. Theory does not exist save for purposes of practice. Human practice, the effort to master man's difficulties, has theory for its indispensable first stage. Between them there is a constant ratio, for they are co-determining elements of the unit life.

*Read before the Pedagogical Seminary of the University of California, February 10, 1900.

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The value of history lies in the fact that it confutes shortsighted theories and confounds imperfect practices. It is human experience up to date. It supplies the consciousness of the race to correct and verify the efforts of the single subject. It offers him a memory which encloses thousands of years to amplify his brief time-span. It supplies purpose and reason where the single eye sees only chance and irrationality. It holds for him a mission and hope with which to overcome the limits of scant years, and to his serious attempts it is a constant criticism. In the experience of the race all abstractions are concreted and all dualities are resolved. History is the great unifier; all things assume their due place and meaning through her. That the forms of human effort can exist in their abstraction, is an error which the history of education will dissipate; that the school has a mission of its own quite distinct and different from the mission of every other form of social organization, it will deny; that it is a fixed form unrelated to and not sharing in the commonwealth of changing thought, is a belief wholly without historic support. History will show that the school was organized to continue and bring to a higher degree of perfection the very experiences which were monopolizing the interests of the society in which it existed; that its problems were the problems of its time and place; that it existed as a motor-tendency expressive of the social sensorium, seeking to direct rather than to create the activity in which it dealt. The history of education is thus of constant value to the theory of education, for it embodies the earlier successes and failings of the process of which it is a part.

Education arises in any society whenever values are recognized which cannot be imparted by the ordinary means of social intercourse. It exists in some form among every people known to history. Among savages it is of the greatest value to shape and handle the bow skillfully; bare imitation will not transfer this skill; a crude school is set up. But the social values which were earliest cherished

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and transferred through the medium of instruction were religious. The god was believed to impart his will to individuals. This knowledge was of the greatest social value, but was not a common possession; it could be imparted only in special ways: hence the earliest teaching belonged to the medicine-men and the priests. Certain forms of address, of ceremonial approach to the diety must be rendered literally; writing was invented to preserve them. The crowning find in the recent explorations of Mycenaean culture in Crete is a continuous inscription of a very ancient date, taken from the great cave of Psychro, the fabled birthplace of Cretan Zeus, which was undoubtedly the seat of a very ancient cult. This broken stone "with writing" is described as a "dark steatitic fragment, bearing part of an inscription, clearly cut in characters about an inch high, arranged in a single line. . . . . There are in all nine letters with probably syllabic values remaining—apparently about half the original number—and two punctuations." *

And so all early forms of knowledge follow: the imperishable and the beautiful are sought out for their use in worship; the god must have a proper place of abode—at length a splendid temple must be built, which requires a knowledge of architecture; the temple service must be both rare and expensive—high skill in the use of metals is thus developed; a rudimentary science grows up within the priesthood—a primitive natural history, meteorology, and astronomy: all these are the undifferentiated parts of religious worship. But they begin to differentiate themselves, in that they are the peculiar possessions of the cult, are guarded as its mysteries, and transmitted as parts of its sacred learning. Thus knowledge grew at first as a sacred rite. Even its more common forms were propagated in this way: not only does the worship of Bacchus convey a wild and delirious sympathy with the changes of the year; it is also a primitive school of agriculture, in which the

* Note, p. 292, The Mycenaean Age.

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activities of the worshipers are typical of the gathering and the preparation as well as the consumption of the grape. More striking, perhaps, than any other form of knowledge which grew up in this half unconscious way was the body of laws which developed about the worship of the god and which were for centuries the unwritten codes of those early states.

But, more particularly still, the religious service when divided into its separate activities became the course of study, that part of it at least which is designated by the general term music, which was at first the attempt to express meaning by bodily movement or general gesticulation, and as such became the dominant art of early Greece and the key to the Greek theory of the beautiful. The chant grew up along with it, and together they formed that primitive ballad-dancing which is the beginning of a nation's literature as well as of its dramatic art: the song rises above the dance in importance and the epic is born; highly wrought description depending upon rhythms and metrical art gives the ode, the sonnet, or the hymn; while action triumphing over words in the expression of thought gives dramatic art. Thus the threefold division of Greek music which formed so essential a part of Greek education is directly traceable to an earlier form of religious life.*

There is another religious institution, at one time possibly much akin to the dance but appearing in literature quite distinct therefrom, which must be regarded as a pedagogical institution also—possibly it was the first in which theory and practice were consciously separated—the games of Greece. One can trace three steps in their development: (1) play as a spontaneous expression, the ebullition of human activity without order or form—a condition in which neither social convention nor any form of necessity has declared that one kind of action is to be preferred before another; (2) a second stage appears when certain forms of this originally purposeless activity become

*Moulton, The Ancient Classical Drama.

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attached to the service of religion, as in the feasts or in the burial of the dead. The games are thus institutionalized, being organized as fixed forms of social activity; (3) a third stage enters when they are freed from this conventional attachment and become ends in themselves. The prize is no longer the honor of the god or of one's friend; it is something given to the victor. Homeric life has already reached this last stage, although there are evidences of the second still remaining.

These were the early forms of activity out of which Greek instruction grew. It was not merely an unaided evolution which hastened their differentiation into greater complexity; evidence is not wanting to show that the Greeks profited by a body of experience not their own. Just what this borrowed experience was, whether of Egypt, Israel, or of the remote East, who shall say? None has as yet been able to unwind the threads of tendency and from them make a chain binding that world of older effort to the new.

Teaching began in Greece when the consciousness of power as opposed to end or use arose; in other words, when reflective experience had advanced so far as to separate the agent from his action. It became necessary to develop the agent at this point; he must accumulate potential energy and store up resident or latent power. But at first only cases of mark caught the attention; the sons of heroes were educated but not the common fellows. The teacher himself must be a marked instance of prowess. Education was then a class privilege and belonged only to the strikingly promising within the class. Ordinary unorganized imitation was good enough for the rest of society, which had not been fitted by the gods for heroic deeds. The accounts of the earliest school in Greece were long since given to the world as poetry. In fact, it is hard to conceive of them as ever having belonged to the austere realm of facts, so fanciful are they and so far removed from rigorous need. And yet we are forced to believe that they were not merely

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fanciful; that the events described existed elsewhere than in the playful imagination of later days, and that the grain of truth which is the primal reason for the myth existed here also. The tale, at any rate, stands for certain facts in the consciousness of very early Greeks, and this fact must be assigned its place.

Cheiron, half-man half-horse, that air-piercing combination of the skill of the one and the strength and fleetness of the other, to which the ancients gave the name Centaur, conducts a school for heroes. Charles Kingsley has described it thus: "The lad Jason enters the lonely cave at the foot of a mighty cliff, which is the abode of the master and the seat of the school. Inside he sees the master lying upon bearskins and fragrant boughs—Cheiron, the ancient centaur, the wisest of all things beneath the sky. In his hands he holds a harp of gold which he strikes with a key of gold; and as he strikes, he sings until his eyes glitter and fill the very cave with light. He sings of the birth of time and of the heavens and the dancing stars, and of the ocean and the ether and the fire and the shaping of the wondrous earth, and he sang of the treasures of the hills and the hidden jewels and the veins of fire and metal and the virtues of all healing herbs, and of the speech of the birds and of prophecy and of hidden things to come. Then he sang of health and strength and manhood and a valiant heart, and of hunting and wrestling and all the games which heroes love, and of travel and wars and sieges and a noble death in fight, and then he sang of place and plenty; and as he sang the boy listened wide-eyed. Then the pupils came, Aeneas, Heracles, Peleus, and many another mighty name. 'Come out, Father Cheiron,' they say, 'Come out and see our game.' And one cried, 'I have killed a deer;' and another, 'I took a wild-cat among the crags;' and Heracles dragged a wild goat after him by its horns; and Aeneas carried a bear-cub under each arm and laughed when they scratched and bit, for neither tooth nor steel could wound him: and Cheiron praised them all,

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each according to his deserts. Only one walked apart and silent, Asclepius, the too wise child, with his bosom full of herbs and flowers and round his waist a spotted snake. He came with downcast eyes to Cheiron and whispered how he had watched the snake cast his old skin and grow young again before his eyes, and how he had gone down into a village in the vale and cured a dying man with an herb which he had seen a sick goat eat, and Cheiron smiled and said, 'To each Athene and Apollo give some gift and each is worthy of his place, but to this child they gave an honor beyond all honors, to cure while others kill.' Then the lads brought in wood and split it and lighted a blazing fire, and others skinned the deer and quartered it and set the pieces to roast before the fire; and while the venison was cooking they bathed in the snow-torrent and washed away the dust and sweat, and then all ate till they could eat no more and drank of the clear spring water, for wine is not fit for growing lads, and when the remnants of the feast were put away they all lay down before the fire and each took the lyre in turn and sang and played with all his heart. And after a while they all went out to a plot of grass at the cave's mouth, and there they boxed and ran and wrestled and laughed till the stones fell from the cliffs. Then Cheiron took his lyre and all the lads joined hands, and as he played they danced to his measure in and out and round and round. There they danced hand in hand till night fell over land and sea, while the glen shone with their broad, white limbs and the gleam of their golden hair."*

While this is indeed an idealized sketch of the education of a hero, no one who is familiar with Greek mythology and the Homeric tales can fail to find in it also a sketch of the Greek spirit and of the early activities out of which later forms of life and interest developed. If Cheiron had a school, and all reports agree that he had, it must have been something like this. Its activities were the ordinary activities of Greek life. They were followed not more for

*Kingsley's Greek Heroes, pp. 121-2.

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distant ends than for themselves. They were the things which Greek boys did. But here they were carried on in the aggregate and under the best advantages. Some men were more skillful than others—the apprentice system soon marked them for its own. Just as some of them became minstrels in those early days, so others became trainers of youth, imparting skill for its own sake quite as much as for remote advantage. The course of study at Mount Pelion, as it existed for the young Achilles, consisted of instruction in riding, in hunting, in the use of weapons, in the dressing of wounds, in the use of medicinal herbs, in singing, and in playing upon the lyre. Even here subjects begin to group themselves in classes and instruction begins to be specialized to suit different abilities. Aesculapius and Achilles find pleasure in a different class of activities from that which the others follow, and are given larger opportunities than their fellows in the chosen direction. The glad rollicking of the present which the others pursue because they are boys and these are the things which boys do daily in Greece, they leave for a moment to gain skill for a more remote end and to develop theory for future occasion. We may safely infer that there was little of system in this earliest educational expression of Greece. But however we may regard it, we shall be forced to admit that it differs in several particulars from the training which is given by ordinary experience and transmitted by social imitation. In the first place, it stands for aggregation of pupils with the attendant opportunity of competition within the group. Their life was a group life, where like and differing interests work themselves out freely together. There the youths found a social environment of their own, where, free from superiors and inferiors, each came to his own personality by means of a series of equalities. In this school he learned justice, which, though it was only the worth for his class, was certainly a more desirable worth than he could have attained elsewhere. Moreover, he developed himself here under the best conditions. Although there was but little

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teaching, still the opportunities for imitation were the best that could be had. Cheiron stood for superior skill in the activities of Greek life and to belong to his school meant to have constant opportunity to see the thing done in the best known way. The aggregate life, association with a teacher to his contemporaries superhumanly skillful, and the opportunity to share in its rudely classified activities, were the advantages which Cheiron's school offered.

But the Homeric age came to an end and the glamour of an heroic time wore away under the pressure of a more complex life. Its aspirations did not die; instead, they remained, much modified indeed by the larger demands of a greater strenuousness. The vague, uninterrupted peace of the present tense is broken, and the golden age of untroubled self-expression is gone; the earth no longer produces spontaneously for all; the laborer no longer serves without protest. A foreign foe begins to menace the borders, and domestic peace is not so peaceful as before. Inner demand begins to exceed the possibility of immediate outer realization. Social need rises beyond aggregate capacity. Ends disassociate themselves from means, for means are no longer sufficient for ends. The gods have allowed strife to enter and the peaceful unity of the world is broken. These are the Dark Ages of Greece, out of which a new order of society is born. They end in an early Renaissance and a vigorously protesting humanism. The new light breaks first in Ionia.

Hegel has defined philosophy as "being at home with self." The self includes the world of one's own experience, and philosophy arises when one domesticates his mind, when he tames it by answering its questions and solving its problems. Now, problems arose in Ionia much more rapidly and in greater number than they did in other parts of Greece: it was nearer the seats of ancient civilization; it was also nearer the armies of oriental conquerors. The swift ships of the Mediterranean dropped anchor in her seaports. Moreover, Homer and the wandering bards who

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came after him had sung of heroic deeds to her people. Men first strove to be at home with themselves through speculation in Ionia, because there they were earliest exiled from that unquestioning at-homeness which belongs to early men and children.

There is every reason to believe that the unwritten political history of Greece is of like kind with that of other peoples; that, as elsewhere, the earliest basis of social organization was the family and the common worship of protecting family gods. Next society outgrew the family as a basis of organization, and *pari passu* left behind its earlier gods. The blood-bond gave place to the land-bond, and the territorial enlargement of the family into the phratry was accompanied by the growth of locational gods: divinities of the neighborhood or place; the natural forces which control its fertility, its beauty, and its terrors. Thus the gods become fewer in number and have larger powers. With the development of the land-bond, society began to be divided into two classes, the haves and the have-nots. Struggle for existence became struggle for domination. The distinguishing qualities of one class were transmissible and increased in value with the lapse of years. It became the more deeply intrenched through its *propria* as time went on, and we may believe that protest thereat increased with time also. The nobility of the land took refuge in combination; cities sprang up as the result. The city became the means of marking off the citizen, or noble, from his enemy, the rustic. It became the chief duty of the citizen to protect himself or to rule over those who menaced him. Having leisure, necessity, and a past, he became a plan-maker. In time he came to regard his function as that of manufacturing θεώρια while others must contribute πρᾶξις. Thus the early development of reflection and artistic effort was made, and the dialectic of civilization was set in motion. The problem is plainly set in the necessity for a better political organization in which the different parts of society will function more harmoniously.

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This is the problem of which Hesoid writes. It is the problem which held the attention of the Seven Sages. This division of society set serious questions for all Greece, questions which were ever in the Greek mind from this time and which have been an integral part of philosophy ever since. Who shall govern and how, is one of them. Not he who claims to be born of the gods, for Homer had thrown discredit upon the gods. He had brought together what men in many places believed concerning them; as long as these tales existed singly they might be believed, but when placed side by side in deadly parallel they destroyed each other. Out of this warfare of conflicting mythologies, which were able to maintain themselves in isolation, but whose every possibility of continuance was destroyed through that confusion of comparisons born of formulation and a freer interchange of thought, men lost faith in the gods who allowed themselves to be so manifestly lied about; and the necessity for a new formulation of being and duty arose. Thus early men were evicted from their familiar at-homeness with the gods and forced to build for themselves nobler temples of thought in which to dwell.

This necessity was first and greatest in Ionia. Here, as everywhere, the new structure was built out of the community-consciousness. The mind of Ionia is full of the sea, of shipping, of winds, and conflicting natural forces. The world everywhere must be like Ionia, washed up by the sea, depending upon the sea, perhaps at length returning to the sea. In a sense Greek philosophy exists as a criticism of Greek literature: the philosopher is the direct descendant of the poet. The difference in results is a difference due to the accumulation of intelligence and to the stress of a new social life. But their methods are largely the same at first; the one reproduces the dogmatism of the other. In its earlier forms, Greek philosophy asserts principles. It does not attempt to explain them, much less to deduce them by a process of sufficient proof: its utterances are oracular: there are no stages to its vision of truth. Yet in all these

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efforts we recede from immediate sensuous existence. Things are not what they seem to be in their particularity; a provisional universal, a basis of relation, has been reached. But there is no method in its determination: no reason can be given for saying that it is water rather than fire; and it is this very lack of method in hylozoism which prevents it from becoming a system of education. Its facts once arrived at can be transmitted only as single facts of experience. There is no peculiar basis of proof, no formulation of preconditions; only assertion. Of attempted classification there was none; nothing that could in any sense be called scientific. And without some special formulation through inter-relation of experience, no education is possible; for it does not exist to transmit facts or single experiences, for they are personal and have their being only as resultants. But education does exist to show the inter-relations of facts, to impart a knowledge of processes, to show forth principles or laws, orders of combination, sequences, uniformities. Now it was because the Ionians were not greatly concerned with laws that they did not found a school.

The formulation which Pythagoras made was different. The scene of his activity is Greater Greece, or Lower Italy, where Greek colonies from various states had settled and built flourishing trading towns, rich both in people and in possessions. Pythagoras was theologically-minded. He was much versed in the old observances, not only of the fatherland, but as tradition has it of Egypt also. He finds a new unity after the fashion of that which men have already employed in music and the ordered dance, and the symbol of this new unity is number; which for him had reconciled conflict wherever it had been introduced, though it had not hitherto been seized upon as a means of ordering. Thus the beginnings of reflective thought are made in the attempt to be at home in a world made after the fashion of the old. But the need and at the same time the possibility of its reconstruction lies only in the new. The doctrine is possibly more the work of his disciples than of the master,

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but the beginnings were his and his the enthusiasm which started the movement. Aristotle has stated their doctrine in a single proposition, "Number is the reality of things; and the constitution of the whole universe in its determinations is an harmonious system of numbers and of their relations." The unit is the basis of the system; the one is the all-inclusive, the ever-present similarity through which the whole is harmonious. "Unity is the principle of things, for partaking of it each is called one." But the universe is not merely a blank one. It is also a many, embracing a multitude of detailed determinations. Unity is the number one; difference is two; in three we get unity of differents. "Two we call both, but not all; we speak first of three as all." Of this system Aristotle declares: "In numbers they thought that they perceived much greater similitude to what is and what takes place than in fire, water, or earth; since a certain property of numbers is justice, so is it with the soul and understanding; another property is opportunity, and so on. Since they further saw the conditions and relations of what is harmonious present in numbers, and since numbers are at the basis of all natural things, they considered numbers to be the elements of everything, and the whole heavens to be a harmony and number." This doctrine is somewhat familiar to early peoples in their belief in magic numbers. In the Old Testament it is to be found frequently: the seventh day is the Lord's; the people shall march around the city seven times, then the walls will fall down. The number is the essence of the act. Even in the modern science of mathematical chemistry the essence of combination is the number employed. And the attempt to determine the world upon Pythagorean principles is by no means unfamiliar or outgrown.

With Pythagoras, philosophy began to possess something of hidden meaning, a problem, and a method; a complexity, in part ordered and arranged. It began to be a thing of relations: something which could be taught, and which could be acquired only through teaching. Thales did not

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attempt to trace the law in things; Pythagoras not only attempts to trace the law, but endeavors to apply it to human conduct. His one great insistence was that teaching shall not only convict but shall also regulate. To this end he not only instructs his friends; he founds a society by associating them together in a league for the purpose of making them skillful in business and eminent in morals. This league was a sort of priestly brotherhood. The instruction of the members was of two kinds, exoteric and esoteric. The former included a novitiate of five years, during which silence was enjoined upon the pupils. The inner circle was instructed in the highest branches of science and its members took an active part in politics. Each member was required to surrender his property to the league upon entering it, but it was returned to him upon his withdrawal therefrom. Pythagoras introduced the teaching of science into Greece. He maintained a school with a course of study and grades to meet the varying advancement of pupils. No rule of this wonderful school seems so incomprehensible as that imposing a continuous silence upon the novitiates in the league. But there was good pedagogical warrant for this rigor. The pupils of the school were largely adults, wholly untaught heretofore. Each newcomer brought with him an unordered and incoherent mass of social tradition and unthought experience. The first lesson which Pythagoras sought to impart was that this unscientific mode of thought and speech must be left behind. In comparison with the forms of truth which he served, their idle prattle was of no worth. They must endeavor to keep their minds empty. So nearly as possible, they must maintain the suspended judgment while the new truth was being stated. After sufficient familiarity with it, when they had proved themselves able, they were admitted to a larger freedom. Socrates made it a common saying that the first lesson one must learn is that he knows nothing. Pythagoras assumed this truth and made it a principle in his school. He was an innovator among his

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countrymen. He occupied a kind of prophetic position among them, with a privilege and possession of truth which they did not enjoy. That they so regarded him, is evidenced by the myth in which he is reputed to have been a son of Apollo. Occupying this exalted position among them, he was expected to teach through established forms. The number of his students demanded it also; and the chaos which obtained everywhere in men's thinking, was to him a sufficient warrant for such procedure. That he did not regard himself as a fountain of wisdom is proved by his choice of the word φιλόσοφος rather than the commonly accepted σοφός to designate his position. He chose to be called a lover of wisdom rather than a wise man. But even as a lover of wisdom he had attained a certain relation to wisdom which he could impart to his followers through forms which required unquestioning submission better than in any other way. The law is a schoolmaster to bring one to the knowledge of truth, and Pythagoras employed the law. He was the first man in Greece to obtain a universal view, a totality; and this view he must impart at first only in a fragmentary manner. His pupils must become familiar with it in every possible way before they can recognize it, and appreciate its worth and meaning. Thus with them as a rule of life it becomes an operative principle before it is known through reflection. At first the youth was introduced to the subject-matter of instruction in the form of a catechism which he must commit to memory. Questions and answers were exchanged after this fashion: "What are the islands of the blest?" "The sun and moon;" "What is the greatest wisdom?" "Of measure and number;" "What is the greatest beauty?" "Harmony;" "What is most powerful?" "The Intelligence;" "What is best?" "Happiness;" "The beginning is the half of the whole;" "The sea is a tear;" "The clang of metals is the voice of an imprisoned spirit." To this instruction were joined many rules of conduct which were also memorized: "Give not careless attention to the right," "Thou

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shalt not neglect the balance," "No one is free who has not mastered himself entirely," "Follow God." The members of the school adopted a common dress and a limited vegetarian diet. Belief in the transmigration of the soul was a tenet of the cult. They dined together upon a simple meal of which honey and bread were the chief items, while for drink they chose water. Their association was a semi-religious one and much stress was laid upon moral precept and practice. Pythagoras sought to reform the religion of his countrymen and at the same time to improve their political and social condition; this he endeavored to do by instructing them in rules of conduct; these rules were dogmatically presented and dogmatically held. In this respect the Pythagorean brotherhood became a close corporation with plans and ends of its own, and its members endeavored to lead an exclusive religious life. Pythagoras seized upon music as an instrument for the advancement of this religious attitude: "Music," said he, "is the harmony of the world. It builds itself into the soul and attunes it to the proper life. It transforms the emotions and through its agency even the ills of the body are healed." Their chants were performed to the accompaniment of stringed instruments, as the lyre or the harp. The use of wind instruments was interdicted among them on the ground that they were too exciting. Music was not followed for its own sake, but as a means to physical and moral upbuilding. To this end it must ever remain of a mild and soothing character. Gymnastic is used to much the same ends. But the chief instruction which the school offered was in mathematics; numbers are the first necessary object of all true study and the science of numbers is the fundamental science, for the form of everything is numerical and numbers are the symbols of all thought. Just what a Greek meant by music and what subtle and far-reaching influence it had upon them, no modern can tell. They have left us nothing but hints of what it was to them. But we have been taught to comprehend the mathematical dreams of

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even such a mighty mystic as Pythagoras, and have come to feel that they were not entirely vain.

A knowledge of geometry is of service in dividing the land and in erecting the public buildings of a country; a knowledge of arithmetic makes trade possible; while some knowledge of the stars enables one to sail in ships: all these were demanded and used by the Greeks in Italy. Pythagoras is but raising a popular interest to a higher power in his insistence upon mathematics and mathematical study. Since things are in their essence numbers, the way to know and control things is through a knowledge of number. Spirit is unity, because all things are encompassed in its vision. Matter is two, because it is made up of earth and water. These forms of reasoning also lead them to the conclusion that the earth is a sphere and that its rotations constitute the change of day and night. These and many kindred speculations formed the subject-matter of the Pythagorean number-teaching. But numbers were especially useful in that they led to moral action. They were exact expressions of that measure and balance which it was the conscious effort of every Greek to attain in his own conduct and which indeed from the earliest times was the ethical ideal of Greece. "Justice," they said, "is a square number, for in it passion and action are exactly equal, and through it the injury returns upon itself." It was because of the infinite suggestiveness of this form of thought that it formed an integral part of every subsequent philosophical system, and that its attempted revival constituted the dying effort of the philosophical spirit in Greece. The brotherhood itself did not long survive the death of its founder. It fell a prey to the characteristic political struggle of the time; that of the ruler and the ruled, the tyrant and the citizen. But its very constitution seems to have been alien to the Greek spirit. Pythagoras seems to have derived its form from the priestly associations of Egypt or Asia. Its Oriental exclusiveness did not commend it to liberty-loving Greece. The Pythagorean could not function as a free

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citizen, nor could the free citizen sacrifice his freedom to such an oath. As a result, the fixed form was shaken off, but the spirit and the results of their efforts remained permanent additions to the culture of Greece.

Greek genius displayed itself first in Asia Minor, next in Italy, last of all in Greece proper. In Ionia it was quickly crushed out by foreign invasion. The peace of the colonies was menaced by foes from the south and foes from the north; on the mainland alone were the Greeks able to found a permanent home. Among the numerous political families which strove to this end two are of especial interest to us here, the Spartan and the Athenian. The early Dorians are said to have favored democracy; their later representatives, the Spartans, represent an aristocracy of the most rigorous kind. Just who they were, and whence they came originally, no man can tell. To state their relation to the Ionians has proved itself to be one of the impossible problems of history. One school of interpreters maintains that the Ionians were the original inhabitants of the land, whom the Dorians, an invading race, sought in vain to subjugate; another school regards the Dorians as Greeks who had not advanced beyond the barbarian stage in development; and many other theories are proposed, with no great unanimity among them. But our task is rather that of contrasting the widely differing methods and accomplishments of these strikingly opposed peoples. In the first place, the Ionians seem to have occupied a position more accessible to the various agents of other civilizations. They dwelt in seaport cities which were open to the merchants and travelers of other lands. Babylon and Egypt undoubtedly contributed greatly to their advancement. Their national ideal, Sophrosynê, which meant self-control, temperance, or proportion, prohibited an inordinate devotion to warfare or to money-getting. Although skillful in both these directions, they despised their neighbors who chose for themselves a single activity. The savage peoples of the north made constant war; the Phoenicians sought

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only for wealth: both were a term of reproach to the culture-loving Ionians. But their nearest neighbors followed a different ideal. Athens was a city; but Sparta was a citadel, and its life the life of one great military camp. The most reasonable interpretation of this great difference seems to be that* which regards Dorian customs as old tribal institutions brought with them by the invaders of the Peloponnesus, and relied upon to protect them against that more numerous folk which they subjected. Being a few against a multitude, it became a matter of life and death with them to maintain the military skill which would keep them conquerors. Their whole life was organized to this end. No single interest could compare in importance with this interest, which was of the state, including the whole governing body, the entire conquering race. This compliance with the demands of the law, which was, at the same time, the military plan of self-protection, became the ideal for every citizen. To this end Thucydides records the saying of a Spartan king that his people were brought up "too ignorantly to despise the laws, and with too severe a self-control to disobey them." Their every activity was made subservient to this end: their goods were common goods; their relationships were not private but general; their meals were in common, and the bill of fare prescribed by law; their exercises and their occupations were determined by enactment. The Spartan was lord in Sparta; the helot or slave counted for nothing in ruling the state. He was there to be ruled, but by no means to get into power. Instruction in Sparta had for its only task the shaping of such rulers. The process began when the child was very young; at seven years of age his mother passed him over to the state. Here the lads were arranged in three groups: from 7 to 12; from 12 to 15; from 15 to 18. Gymnastic was the chief feature of instruction. It was conducted for the purpose of making soldiers. Each lad must be trained to run, to jump, to fence, to ride,

*Benn, The Philosophy of Greece.

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to swim, to cast a spear, and to shoot. The young children were exercised in running and leaping. Next ball-playing and exercises for strengthening the arms were employed. In the other classes military evolutions, wrestling, and the throwing of the discus and weights were the chief exercises. The Spartan took a great pride in beauty of form, but the chief end of this instruction was by no means aesthetic. The youths were taught to dance, but here again the purpose was to prepare for war. Dancing was a military exercise, undertaken for the excitement which it brought as much as for the grace and ease which it developed. Music was employed to the same end. Through it courage and love for the fatherland were developed. It must ever be serious, measured, and forceful; never frivolous or gay. Reading and writing did not originally belong to Spartan instruction. They were introduced at a later period. The instruction of girls was of much the same kind. The great hope of a Spartan mother was to bear sons for Sparta. A citizen who had three sons to offer the state was himself placed on the retired list, thereafter to be free from military drill; while exemption from taxation was the privilege of him who had four to offer. That there is a close connection between Spartan education and the system of Pythagoras is often pointed out. Pythagoras is said to have been a Dorian, at least in spirit. Both educational systems are formal. In both the individual is to be governed by rule, is to be a submissive unit in a problem in the stating of which he has had no share. Both organizations were forms of socialism, barren of individual spontaneity. There is little doubt that Pythagoras sought to oppose the prevailing disintegration in religious observance by offering mathematical sanctions for the old religious morality. In other words, he attempted to find philosophic reasons for perpetuating Doric life. His problem was much the same as that which Sparta set for herself. Both movements were conservative in the face of change. Both sought to restore the past. But Pythagoras brought an

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insight which lent novelty to his task, which was wholly wanting to the half-mythical Lykurgos. Both organizations exist in part for political purposes. Through the influence of the Pythagoreans, we are told, "order, freedom, civilization, and law were reëstablished in Crotona and all Magna Grecia." But these socialistic attempts to solve the labor problem in Greece and to check a popular revision of the common faith were not permanently successful. Men in general had undertaken a great task: they were in search of homes—not dwelling-houses merely, such as are referred to scornfully in the phrase "three acres and a cow," but domesticity in the world of politics and ideas as well. The tendency of the time was toward the growth of individuals. The growth of the land-bond had made this necessary. With the growth of cosmopolitanism, the authority of the old religion was fast disappearing. The attempt to reëstablish the old order was vain; men were already devoted to the search for new formulations of life and new sanctions for conduct. It was no longer sufficient that the gods made demands, or that the state still existed. The objective world ceased to satisfy; the conscious energy of Greece sought new gods to serve and found them in themselves. The socialism of the Pythagoreans and the individualism of the Sophists grew out of the same conditions: they were both one-sided answers to the same problem. The one set up an objective determination: the other replied by supporting a subjective eudaemonism. Obedience became the watchword of the one: happiness became the aim of the other. Study was for the mystic a path which led to self-absolution: with the other it led to self-possession. Neither of these disciplines interfered greatly with the customary training of the younger children. The paelestra and the music school pursued their accustomed work. Pythagoreanism emphasized the importance of mathematics and so enlarged the course of study in this direction; the Sophists emphasized style, form, rhetoric, argumentation, and added them to the curriculum. But

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the great educational importance of both these schools is due to the fact that they were the first universities of Greece, schools of inquiry in which the dominant forms of Greek thought along many lines originated.

Athens is the center of individual development in Greece. It is the place where the citizen freed himself in the largest measure from bondage to social habit and worked out his own processes of reconstruction. But the influences which culminated in her were not all of her making; they belonged to all of Greece, and to the entire history of the Greek peoples. In very early times, in the beginning of the great break-up of the old immediate life, when first the objective world ceased to satisfy and the merely impulsive life began to be no longer possible, a very simple form of reflection arose in the person of the Gnomic poets who dealt with conduct after a dogmatic fashion. From these crude beginnings subjective thinking arose, and increased in complexity in direct correspondence with the complexity of social life. This form of thought found its most adequate expression among those thinkers who cut loose from the formal side of life, from established conventions and accepted faith, and sought to comprehend its individual expressions. While it cannot be said that these men forsook the search for a universal principle, it must be noted that while they did not cease to set up such a principle directly, they also attempted to support it by a study of parts which would yield a whole. Their science was something more than assertion; it involved a study of particulars and a kind of proof. Heraclitus is of this kind, and the atomists showed a regard for concrete things. The atom is the individual, the indivisible. This formulation of the world belonged to a time when the individual citizen began to be regarded as the essential factor in the state. The blank universal was no longer satisfactory. But the limitation of this school lay in the fact that its individual was logical but not vital. Origination came about through the bare conglomeration of atoms which

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were in themselves neither passive nor active, "for they merely abide through the vacuum," and so are utterly lacking in process-reality. The real world is still frigid, dead, immovable. A god or chance must move it. Such it was, indeed, for almost all early speculation. Neither persons nor things were looked upon as self-determining realities. Zeno had created dialectic through his inability to make these formal determinations square with each other, employing a new method to reduce ordinary thinking to an absurdity. Next Anaxagoras arose, pointing to a new principle in the phrase, "the understanding is the disposer of the world." Thus from the attempt to explain the world formally which belonged to the mathematical school, through the attempt of the atomists to treat it as a system of accidental aggregates, we come to the characteristic thought of Greece which was teleological, having to do with consciousness, setting up definite ends and organizing means for their attainment.

History declares that Anaxagoras brought philosophy to Athens, that its earlier forms belong to Italy and Asia Minor. At any rate, it is in Athens that all previous philosophy finds its resultant, in answer, as it were, to the problem which Anaxagoras had half solved in his theory of the determining mind. But the answer which Athens gives partakes of the individualism of the atomists, of the logical necessity of Zeno, and the νοῦς of Anaxagoras, which is now particular. Hitherto Sparta had been the dominant city of Greece, and Lacedemon the head of the Greek states. But its organization was void of spontaneity; hence it did not develop arts or sciences. The person was subordinated to the state: he was born into an order already fashioned: he could not be a man and remain in such an order; hence the Spartans remained something less than men with free initiation and a consciousness which was other than state-consciousness. From the time of Solon it had been different with Athens. Instead of a merely formal democracy based upon an aristocracy of law,

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a universal in which the individual does not share but to which he must submit, Athens had enjoyed for periods variegated by the rule of tyrants, a popular government. Solon had given equality of law as well as unity of spirit; he had made room for individual expression; he had entrusted the executive to the people. In its earlier forms the individual spirit had expressed itself in terms of the universal in perfect unison with the established morality, religion, and law. The subject had not as yet set himself in opposition to the whole of fixed custom. The worth of Athenian society, the beauty of contemporary life, the glory of the protecting gods, demanded his highest efforts. In creating the great masterpieces of Greek art, he was but an artisan who put his soul into the service of a world so glorious. But in the very service of society he became conscious of his own individual powers and was henceforth an artist. The state which called for individual initiation on the part of its component units, which set up a sufficiently undefined law of organization, which did not assume the details of its being hard and fixed from the first, but left open opportunities for a process of internal development, such a state was Athens; plastic throughout, a training school for subjectivity, the free development of her citizens. We find Pericles in his famous funeral oration dwelling upon these very qualities of Athenian life: "Before I praise the dead, I should like to point out by what principles of action we have risen to power, and under what institutions and through what manner of life our empire has become great. * * * Our form of government does not enter into rivalry with the institutions of others. We do not copy our neighbors, but are an example to them. We are called a democracy, for the administration is in the hands of the many, not of the few. But while the law secures equal justice to all alike in their private disputes, the claim of excellence is also recognized; and when a citizen is in any way distinguished he is preferred to the public service, not as a matter of privilege, but as the

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reward of merit. Nor is any person who can in any way render public service kept back therefrom by poverty or obscurity of station. * * * Then again, our military training is in many respects superior to that of our adversaries. Our city is thrown open to the world, and we never expel a foreigner or prevent him from seeing or learning anything of which the secret, if revealed to an enemy, might profit him. We rely not upon preconcerted stratagems or trickery, but upon our hearts and hands. And in the matter of education, whereas they from early youth are always undergoing laborious exercises, undertaken to make them brave, we live at ease, and yet are not the less ready to encounter equal perils. * * * If, then, we prefer to meet danger with a light heart and without laborious training, and with a courage that is gained by habit and not enforced by law, are we not greatly the gainers? Since we do not anticipate the pain, although, when the hour comes, we can be as brave as those who never allow themselves to rest; and thus, too, our city is equally admirable in peace and in war. For we are lovers of the beautiful, yet simple in our tastes, and we cultivate the mind without loss of manliness. Riches we employ as means to action, not for boasting and display. To avow poverty with us is no disgrace; not to endeavor to escape it by exertion were disgrace indeed. An Athenian citizen does not neglect the state because he takes care of his domestic affairs, and even those who are engaged in agriculture and handicraft labor are possessors of political knowledge. We alone regard a man who takes no interest in public affairs, not as a harmless but as a useless character. The great impediment to action is, in our opinion, not discussion, but the want of that knowledge which is gained by discussion in planning for action. For we have a peculiar power of thinking before we act, and of acting, too, whereas other men are courageous from ignorance but hesitate upon reflection. * * * In short, I may affirm that the city at large is the instructress of

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Greece, and that each sane person among us seems to possess the most ready versatility in adopting himself, and that not ungracefully, to the greatest variety of circumstances and situations that diversify human life." (Thucydides 36-37-39-40.) Individuality, the consciousness of the power of the single self, has sprung up; but it is still in servitude to outer determination. The unity of Athens was a religious unity: the unity of a religious faith in the nation and her institutions and traditions, her poetry, her religions, her past. The attempt to order the world in terms of mind destroyed this hopeful certainty of youth. Anaxagoras was accused of despising the gods which the people worshiped; he doubted the miracles in which the people believed; he undeified nature, offering them prose for their poetry; he became an enemy to the state and had to flee for his life. Man had served the objective until a subject had been created within him. Then he broke faith with the objective and set about a process of self-glorification. This is the Sophist movement, the great culture-spreading era of Greece. But we must note the forms of educational activity which preceded it. Every Greek derived a great part of his being from the heroic time; their music and dancing, their tales and games became an organic part of the life of all who came after them. Music and gymnastic are everywhere the chief factors in Greek education. They were but socialized forms of the spontaneous activity of their early ancestors. The Pythagorean employed them to develop harmony of conduct, morality; the Dorian employed them as instruments in the making of soldiers; the Athenian used them for the delight which their use gave, and the beauty which it left behind. Lucian makes Solon say: "It is for us Greeks not enough to leave each as nature has shaped him; instead we prescribe the gymnastic training whereby those happily well-shaped by nature are much bettered, while the bad beginnings are greatly improved. Our model herein is the farmer, who so long as the plant is young and tender hedges it about and protects

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it; but when the shoots grow strong, he cuts away its superfluous sprouts and exposes the tree to the violence of the storm, thus making it more fruitful and stronger." Gymnastic, music, and letters were the familiar three R's of Athens and of most of Greece. The laws of Solon directed that all boys should be taught first of all to swim and to read; the poorer ones among them shall then be instructed in agriculture, commerce, or some handicraft; the rich shall be instructed in music, in the customary exercises with horses, in gymnastic, in hunting, and in philosophy. That son whose father has not permitted him to learn a trade is not bound by law to support his parents. No slave shall practice gymnastics. The work of Solon was carried on by Pisistratus, who rendered the study of art and literature possible by founding a national library. The immediate organization of instruction was confided to the family itself; the child was brought up by the family for the state. Plato has given us a most interesting picture of the process in the words of Protagoras: "Education and admonition commence in the very first years of childhood, and last to the very end of life. Mother and nurse and father and tutor are quarreling about the improvement of the child as soon as ever he is able to understand them. He cannot say or do anything without their setting forth to him that this is just and that is unjust; that this is honorable, that is dishonorable; this is holy, that is unholy; do this and abstain from that: and if he obeys, well and good; if not, he is straightened by threats and blows, like a piece of warped wood. At a later stage they send him to teachers and enjoin them to see to his manners even more than to his reading and music; and the teachers do as they are desired. And when the boy has learned his letters and is beginning to understand what is written as before he understood only what was spoken, they put into his hands the works of great poets which he reads at school. In these are contained many admonitions, and many tales and praises, and encomia of ancient famous men, which he

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is required to learn by heart, in order that he may imitate or emulate them and desire to become like them. Then again, the teachers of the lyre take similar care that their young disciple is steady and gets into no mischief; and when they have taught him the use of the lyre, they introduce him to the works of other excellent poets who are the lyric poets; and these they set to music, and make their harmonies and rhythms quite familiar to the children, in order that they may learn to be more gentle and harmonious and rhythmical, and so more fitted for speech and action; for the life of man in every part has need of harmony and rhythm. Then they send them to the master of gymnastics, in order that their bodies may better minister to the virtuous mind and that the weakness of their bodies may not force them to play the coward in war or on any other occasion. This is what is done by those who have the means, and those who have the means are the rich; their children begin education soonest and leave off latest. When they have done with masters, the state again compels them to learn the laws and live after the pattern which they furnish and not after their own fancies; and just as in learning to write, the writing master first draws lines with a stylus for the use of the young beginner and gives him the tablet and makes him follow the lines, so the city draws the laws which were the invention of good lawgivers which were of old time; these are given to the young man to guide him in his conduct, whether as ruler or ruled."

The gymnastic training of Greek youths seems to have been a matter of private enterprise, although there are passages in Greek writers in which the state is represented as building palaestras for public use Wrestling and dancing were the activities which these schools knew. The ancient games of the heroes shaped their curricula, which the varying necessities of war and peace modified. The rules and practices which were followed in these schools are not preserved to us in detail, but Plato has described their aims and something of the method by which they were attained.

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Instruction in music was a thing of private enterprise also. Music for a Greek of Plato's time was a term whose meaning had changed but slightly since it was first used to indicate the early religious enthusiasms of his ancestors. It still meant verse and dancing. To be sure, the song had now become a literature, and dancing a thing of regularity and order, and the lines were separated from the dance, so that music was no longer a name for a single activity but for several; yet they were the same several which had in the beginning been one. To study music now meant to read and commit good poetry, and to recite it; and, in addition to this, to be instructed in figured dancing. In its widest significance instruction in music meant instruction in all forms of polite and refined accomplishment. The music teacher was the moral instructor of the young. For did he not introduce them to the Bible of the Greeks, in which the doings of the gods and moral precepts are recorded? The Greeks, like the Hebrews, were a people with *a book*, and, like them, their education largely consisted in acquiring a knowledge of it. Plato's rationalistic protests against such learning only prove how devotedly it was followed. The music teacher of Greece was a combination of priestly, public, and special school teacher. As a teacher of morals, his work is now largely entrusted to the teachers of religion; as instructor in writing, reading, and arithmetic, the public school teacher now performs his task; while instruction in painting, dancing, and music, as we know it, is generally the work of specialists. This does not mean that the course of study for a Greek lad was longer than that which we know. It was, in fact, much shorter, both in number of subjects and in the amount of attention which each subject received. The esteem in which such instruction was held by older Greeks, and the spirit which they sought to impart to the youths with reference to it, are well told in the words of Sophocles:*

*Fragment 779.

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Since we have rightly made our prayer to God,
Let us now go, O boys, to where the wise
Impart their knowledge of the Muses' art.
Each day we need to take some forward step,
Till we gain power to study nobler things.
Evil a boy will learn without a guide,
With little labor, learning from himself;
But good, not even with his teacher near,
Dwells in his soul, but is full hardly gained—
Let us then, boys, be watchful, and work hard,
Lest we should seem with men untaught to rank,
The children of a father far from home.

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SCIENTIFIC SOCIETIES.

SCIENCE ASSOCIATION.

In accordance with the policy adopted by the Council of the Science Association, hereafter to publish twice a year an official account of the proceedings of the Association, containing a list and short abstracts of the papers read before the various sections, the Secretary has prepared the following report for the first term of the academic year 1899–1900:

The officers for the present year are: President, Prof. A. O. Leuschner; first vice-president, Prof. H. P. Johnson; second vice-president, Prof. W. A. Setchell; third vice-president, Dr. W. S. T. Smith; fourth vice-president, Prof. W. B. Rising; fifth vice-president, Prof. G. C. Edwards; secretary-treasurer, first term, Mr. H. B. Torrey, second term, Dr. E. J. Wilczynski. The officers and proceedings of the several sections are given below.

General Meetings.—1. August 29.—Prof. J. C. Merriam. Report on the Expedition to the John Day Fossil Fields. Published in the UNIVERSITY CHRONICLE, Vol. II, No. 3.

2. September 1.—Prof. W. E. Ritter. The Harriman Alaskan Expedition. Published in the UNIVERSITY CHRONICLE, Vol II, No. 3.

3. October 30.—Prof. Baily Willis of the United States Geological Survey. The Physiography of Puget Sound: a Statement of the Geological History and Development of that Peculiar Feature of the Pacific Coast.

4. November 14.—Prof. W. A. Setchell. A Botanical Trip to Alaska. Published in the UNIVERSITY CHRONICLE, Vol. II, No. 5.

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1.—*Mathematics, Physics, and Astronomy Section.*—Chairman, Prof. G. C. Edwards; vice-chairman, Mr. E. R. Drew; secretary, Dr. E. J. Wilczynski.

October 18.—Dr. E. J. Wilczynski. Dynamics of a Nebula. An account of the speaker's theory of nebulæ, especially those of spiral form. In accordance with the law of gravitation, it was shown that irregular streaks of nebulous matter would adopt a spiral form, whenever a condensation exists. The forms recently photographed by Prof. Keeler with the Crossley reflector, which are almost all spiral nebulæ, accord very closely with Dr. Wilczynski's theory. The paper has been published in the Astronomical Journal, No. 465.

November 16.—Mr. P. G. Nutting. On the Relation between Refractive and Absorptive Indices. A discussion of the different formulæ which have been proposed for expressing the indices of refraction and absorption as functions of the wave-length. Several of the best known of these formulæ fail to represent the facts. The poles of both functions coincide in many cases, but a simple relation between them does not seem to exist.

2.—*Chemistry Section.*—Chairman, Prof. W. B. Rising; secretary, Mr. W. C. Blasdale.

September 13.—Prof. W. B. Rising. Some Applications of Electricity to Chemical Industry. A statistical review of the important chemical manufacturing processes based on the use of the electric current.

September 27.—Mr. W. C. Blasdale. Conceptions of Valence. A historical review of the ideas leading up to the present conceptions of valence.

October 11.—Mr. T. W. Laist. The Periodic Law. A brief statement of the important facts relating to this subject.

October 25.—Mr. J. H. Gray. The Spelling and Pronunciation of Chemical Terms. A discussion of the reforms proposed by the committee of the American Association for the Advancement of Science.

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November 8.—Mr. G. W. Beattie. The Thermo-chemistry of the Ions. A review of a recent paper by Ostwald, in which he shows how the thermal equivalents of the ions may be established.

3.—*Geology and Mineralogy Section.*—Chairman, Dr. W. S. Tangier Smith; vice-chairman, Prof. E. A. Hersam; secretary, Frank C. Calkins.

September 19.—Dr. W. S. T. Smith. Some Aspects of Erosion in Relation to the Theory of the Peneplain. A criticisim of the peneplain theory as advanced by Prof. W. M. Davis, showing that the topographic forms generally explained by that theory may in many cases be produced by erosion acting under ordinary conditions. The paper has since been published as No. 6, Vol. 27 of the Bulletin of the Geological Department.

October 17.—Dr. J. C. Merriam. Extinct Mammals of California. A description of the various occurrences of mammalian fossils in California, of the important discoveries, and especially of the specimens in the University of California collection. A more extended paper on the same subject will soon be published.

October 31.—Prof. Lester A. Ward, of the United States Geological Survey. Evolution from the Standpoint of the Geological History of Plants. The general process of organic evolution was illustrated by analogy with "sympodial dichotomy" in certain plants, and exemplified by the history of several groups of plants.

November 22.—Prof. LeConte. A Century of Geology. A review of the growth of geology as a science during the present century. The change in the trend of geologic thought, from Catastrophism through Uniformitarianism to Evolutionism was emphasized, and the present state of opinion in regard to the more important problems of of geology discussed. The first half of this article appeared in the Popular Science Monthly for February, 1900, and the rest in the March number.

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4.—*Botany Section.*—Chairman, Prof. W. A. Setchell; secretary, Dr. W. J. V. Osterhout.

The Botany Section of the Science Association, as such, has had no meetings, having been practically merged in the botanical seminary. In the meetings of the seminary the subject of heredity was discussed in its different bearings.

5.—*Zoölogy Section.*—Chairman, Prof. H. P. Johnson; vice-chairman, Mr. L. H. Miller; secretary, Miss E. R. Congdon.

September 29.—Prof. W. E. Ritter. On the Zoölogy of the Harriman Expedition.

E. J. WILCZYNSKI,
Secretary-Treasurer.

CURRENT NOTES.

Through the generosity of Prince Poniatowski, the members of the University of California were enabled to enjoy during the month of April five lectures by the distinguished French poet and critic, M. Henri de Régnier, Lecturer for 1900 of the Cercle Français of Harvard University. The lectures were delivered in French at Hearst Hall before audiences that testified to California's appreciation of this opportunity. The subjects and dates were as follows: Monday, April 16, Jose-Maria de Heredia; Tuesday, April 17, Parnassians and Symbolists. Origins of Contemporary Poetry; Thursday, April 19, The New Poetry School; Saturday, April 21, The Poets of To-day. Future Poetry; Monday, April 23, Alfred de Vigny: a Precursor.

For several years the University has given courses in Physics and Chemistry during the summer vacation, and the work has proved so successful that it has been decided to enlarge its scope. The announcement for the summer session of 1900 shows that one course is offered in Philosophy, four in Pedagogy, five in History and Political

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Science, five in the Semitic Languages, one in Greek, three in Latin, one in Anglo-Saxon, two in English Literature, one in American Literature, three in Mathematics, four in Physics, four in Chemistry, and two in Botany. Eighteen of the force regularly engaged in instructing in the University will engage in the work, and the Faculty will be strengthened by the addition of several lecturers from outside the University. Dr. Frederic A. Burk, (B.L., California, 1883; Ph.D., Clark), President of the San Francisco State Normal School, will lecture on "The Development of the Nervous System;" Dr. C. C. Van Liew, (Ph.D., Jena, 1893), President of the Chico State Normal School, will lecture; Professor E. C. Sanford, (A.B., California, 1883; Ph.D., Johns Hopkins, 1888), of Clark University, will offer a course in "The Psychology of Child Study," or some related subject; and Associate Professor Clyde A. Duniway, (Ph.D., Harvard, 1887), of Leland Stanford Jr. University, will lecture on "The History of England since 1483." The session will extend from Monday, June 25, to Friday, August 3; and at the discretion of the instructor in charge, university credit, in general at the rate of one unit for fifteen exercises, may be given for a course satisfactorily completed. The tuition fee will be $10.00, regardless of the number of courses taken, and in Physics and in Botany a laboratory fee of $5.00 is charged, and in Chemistry a deposit of $10.00 is required to cover breakage and use of materials. The University Library will be open five days a week during the session, and full library privileges will be granted any student, whether in attendance on any of the summer courses or not, on payment of a deposit of $5.00, returnable, less unpaid fines or charges, at the end of the session.

Supplementary announcements of University Extension Lectures, issued in March and April, announced the following courses: Archæology. Six illustrated lectures on Greek Decorative and Pictorial Sculpture, by Professor

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Alfred Emerson, formerly professor of classical archæology in the American School of Classical Studies, at Athens, at the Academy of Sciences Building, San Francisco. History. Four lectures on The Growth of American Supremacy in Hawaii, by Mr. Hiram Bingham, Jr., at the Mark Hopkins Institute of Art. Three lectures on Our Commercial Relations with China, by Professor Fryer, at the rooms of the Starr King Fraternity, Oakland. Professor Emerson also delivered four illustrated lectures on Greek Vases; their Forms and Decorations, in Hearst Hall; and six on Greek Decorative and Pictorial Sculpture, in the Chemistry Building.

Desiring to help in securing the funds for the University of California's share in the endowment fund of the American School of Classical Studies, at Athens, the students of the University organized a course of lectures that were given in the auditorium of the Young Men's Christian Association, San Francisco; and by a systematic canvass sold so many tickets that nearly a thousand dollars was added to the fund. The subjects and lecturers were as follows: March 22, England and the Boers, Prof. T. R. Bacon; March 29, The Literary History of the Old Testament, Rabbi Jacob Voorsanger; April 5, Constantinople and the Turks, Rev. C. R. Brown; April 12, Excavations at Corinth of the American School, Prof. Alfred Emerson; April 20, Life at Oxford, Prof. C. M. Gayley; April 26, Joan of Arc, Rev. Father McDonald. At the lectures a number of generous gifts by individuals were announced.

The University Library has been enriched by a valuable gift from Mr. Geo. H. Mastick, a former student in the University: twelve large etchings by G. Vasi, the instructor of the famous Piranese, trimmed and framed together, so as to form a complete panorama of Rome in 1728. The picture has been hung in the north entrance hall to the Library.

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Professor Bernard Moses having been appointed by President McKinley a member of the Commission to the Philippines, the students of the University assembled at the flag-pole at the students' hour, on Friday, April 13, to bid him Godspeed. President Wheeler introduced Judge Wm. Taft, the President of the Commission, who briefly addressed the students. Professor Moses then said a few words of farewell, emphasizing his pleasant relations with the student-body, and stating that he was not breaking the ties that bound him to the university family, but was merely going to do a little University Extension work in the Philippine Islands. On Saturday evening, April 14, the Academic Council gave Professor Moses a farewell dinner at the Merchants' Club, San Francisco.

The Alaska Museum of the University of California was formally opened April 2 by a visit of inspection from President Benj. Ide Wheeler, members of the Board of Regents and of the Faculty of the University, and representatives of the Alaska Commercial Company, the corporation that presented to the University this valuable ethnological collection. The museum is in the east nave of the San Francisco Ferry Building, and is open to the public on Mondays, Wednesdays, and Saturdays.

Through the generosity of Mr. Wm. H. Crocker, of San Francisco, who gave the Regents $1,000 to defray the expenses, the Lick Observatory will send a corps of astronomers to some point in northern Georgia to observe the total eclipse of the sun in May.

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University Chronicle

VOL. III JUNE, 1900 No. 3

STATEMENT FOR 1899–1900.*

By BENJAMIN IDE WHEELER.

The estimated deficit of the University for the year 1899 and 1900 as forecasted in the report of the Finance Committee of October 9, 1899, was $31,000. By careful, if not penurious management, and chiefly by preventing infringement upon the contingency fund, this threatened deficit has been reduced to a real one of about $10,000.

The income for the next year may conservatively be estimated at $410,000. This does not include the $27,000 income from the Wilmerding fund which is being used for the support of the Wilmerding School in the city of San Francisco.

Of the $410,000 estimated income, about $225,000 will come from the two mill tax, of which, under the provision of the law, one-quarter, or about $56,000, will be set aside for permanent improvements. The remainder of the income will be derived from the experiment station fund, $15,000; and the Morrill College Aid fund, $24,000; the scholarship fund, about $5,000, and from investments, etc., about $135,000. Of this income about $56,000, as already stated, must be set aside for permanent improvements. From $27,000 to $28,000 must be appropriated for the Lick Observatory, whose special fund brings in only about $5,400. Ten

* President's Commencement Statement, 1900.

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thousand dollars must be used for scholarships. The income, therefore, which will be available for the immediate educational uses of the University at Berkeley will be a little over $300,000, a sum, however, less than that which the collegiate department of Harvard University collects for tuition alone. The total income of Harvard University for the year 1899–1900 was between four and five times as great as the income estimated above for our University.

Within the past ten years the income of the University has grown about seventy per cent, the attendance of students about three hundred and fifty per cent. This plain fact brings the University face to face with most serious embarrassment. The situation cannot be aided by anything short of permanent sources of income. A University is a continuous existence, and can be safely aided only by funds which yield a stated income, or equipments which involve no expense.

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COMMENCEMENT DAY ADDRESS.*

By BENJAMIN IDE WHEELER.

It may well be that the bustle of these last days in college, the diverting round of fêtes, the veneer of merry-making, conceal for a little from your minds the real meaning and importance of this day to your lives. It is not so with your friends who are assembled here; it is not so with us who have been your teachers. We know beyond a peradventure that your time of testing is come. We see in you a body of men and women who have enjoyed large opportunities; who are blessed with strength, health, and youth; who have before you a world in which is offered the freest field for energy, wisdom, and righteousness that ever lay before the sons of men. All this we see in you and we rejoice. But we see and know as well that education and youth mean no more than the tale of the talents for which you will be called to render account. What will you do with the talents? That is the question. What will *you* do with them?—for it is at *your* door the question knocks. I care a great deal about what you do with them. All your teachers care a great deal; all these assembled here, and the hearts of many absent ones who are with you in thought, all these care a great deal what you do with them. But *we* have done our work, the burden is upon *you*. What you will do with your opportunity depends now upon your choice and your will. You can be what you will to be; you will not be, you cannot be, aught else.

* President's address to the Graduating Classes, 1900.

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So this is the meaning of this day to those who have eyes to see. You take the tiller into your own hands, you strike out to swim in open water, and leave the life-belt behind.

The life into which you are to enter does not differ in kind from that which you leave. The modern college, fortunately enough, has not been to you what the old-time college sought to be to its students,—a place of seclusion from life, pens where human souls were stall-fed, bureau drawers where pears were laid away to ripen into soft succulence. More and more, as the earnest, busy, modern years go by, the modern college is coming into touch with the realities of life. More and more its gates and windows open to the breeze-currents of the outer air; more and more of the real activities of the real world come within its scope to be ennobled and uplifted by its influence. Less and less is the learning of the schools and chairs made an end unto itself; more and ever more is its effect considered in the production of effective personalities, in the shaping of character, of the power to do, and to do nobly and well. Learning which cannot at need be shoveled under boilers and transmitted into power is poor ballast for any craft.

The life into which you are about to enter does not differ so markedly in kind from that which you leave. It is an educational institution as much as this is; it is a great university, the greatest university. In it you will go straight on learning and growing, if you do as you ought to do, and you will learn a great deal more, and learn it more surely than you ever have here. You will find that this greatest university into which you are entering has very definite rules, employs a rigid marking system, tolerates no "cuts," and deals very little in "free electives." As a general rule the kind of men and the sort of work that have succeeded here will succeed there; and this is so because those who have succeeded here have done so chiefly through earnestness of purpose and force of will, for these are the chief conditions of success always and everywhere.

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Wherein then does life differ from the University? I should say in the heightened degree of direct responsibility. Whether you sink or float will, in the future, depend less on buoys and bladders and more on your own good sense and your own good strokes.

You will miss sorely, as the days go by, the kind offices of these good mentors who have told you frankly when you erred, and when you were making fools of yourselves, and as you grow gradually more dignified and inapproachable you will have occasion to miss them ever more and more, for the number of those who deal frankly with your shortcomings (especially if you lack the boon of a faithful wife or husband) is sure to grow less with the years. The farther you get from land, the more ruthlessly will your weaknesses and your mistakes avenge themselves directly upon *you*. The opportunities to "make up conditions" will constantly grow fewer.

That which for the life struggle will stand you in best stead of all you take out from here will, I venture on experience to prophesy, prove to consist of habits more than of lore, and of ideals more than of recipes. The world has more use for trained men than for knowing men, and elects wisdom before knowledge, and character before brilliancy. Fortunate will you be if in the doing of the tasks here you have acquired a self-directive power whereby you can hold body and mind to continuous, definite work,—an honest dealing with honest facts; if you have learned to sail your lives on a definite course, and can steer by help of rudder and keel all your choosings, doings, and thinkings.

The world expects a great deal of you, and it has a right to, for you are the favored children of its opportunites. The State of California expects a great deal of you, for it has given you, so many of you as are from the academic departments of the University, without fee or recompense, advantages which commonly open elsewhere only to the payment of money. It expects to be repaid in no stipulated service, but it expects to be repaid in better citizenship, in

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lives useful to society and the state. It expects to find in you men and women who love the right, who can see the truth and face the facts, men and women who hate a lie and all its vermin, reptile brood that cower in sullen corners and hug the dark,—the lie of ignorance and superstition, the lie of prejudice,—the lie that tabooes a brother man because of station, work, color, birth, or faith; the lie that smirches reputations for selfishness and envy; the lie that urges false motives and seeks to bend the judgment and actions of men away from the true and the real,—the lie whose home is in hell with the father of lies, and whose ways are the ways of death.

The world expects of you honesty and the courage of honesty. It has men enough who have lost all power to see, who are blinded to all but expediencies and have no sense for the truth. It has cowards enough who shrink before entrenched vice and prejudice, and who dare not draw the sword of open speech and ready action against the ogres of untruth and dishonesty, political and social. There never was greater need for courageous, truth-speaking, truth-living men than to-day, when the very pillars of the State are made insecure through cowardice and untruth. The world expects of you action that is based upon intelligence; it has enough of action based upon tradition, prejudice, and narrowness. It expects that what you do, you will do because there is a reason for it. It expects that you will stand fast with those whose action is dictated by reason. The world expects that you will act in loyalty to ideals. All that holds humanity away from the brute is that broader view and larger outlook which merges in idealism. If your education has not given you ideals, then you have not been educated at all. The world has enough men who spend their lives with heads bent over the muck rake, and know not of the blue that is above them, nor of the angel that holds the crown. The world wants more men who live for large things, who take large views of life, who believe that life is more than bread and that the unseen is stronger than

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the seen. Into a life of measureless possibilities you are now entering, and I adjure you in the name of the intellectual faith, in the name of noble academic traditions, in the name of your beloved alma mater, to be true to those ideals which have lived in the life you have spent here in these years that have passed. What you will be, and what you will do, will depend upon what you choose to be, and what you choose to do. The days of your apprenticeship are over. You enter upon the responsibilities of manhood and womanhood; the field is your own, and what ways you choose will be your own ways. What seed you sow will mark your harvest. You can be what you will to be. Be strong, and true, and valiant!

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THE DIVINE ELEMENT IN COMMON LIFE.*

By CHARLES REYNOLDS BROWN.

"The tabernacle of God is with men and he will dwell with them." Rev. 21–3.

The feeling that somewhere a divine being lives and works is instinctive with the human race. Simple, primitive men saw the procession of the stars, the rising and setting sun, the change of the seasons, the fall of the rain, and the motion of the wind, as we see them now. These things were not under human control; they were not made by human hands. There must be lying back some unseen being or beings who made and controlled them. Those early men were not scientists nor philosophers, but in some such fashion they rose to the idea of a divine element in this earthly life.

The next point was to locate these divine beings. Every man had his place of abode; even in the nomadic state he had a temporary spot or tent that was his own. The place of residence for chief or sheik was a matter of importance. Their rude minds were not ready for the idea of omnipresence, even if such conception had been attainable. We find, therefore, many rude attempts to fix the home of these divine beings.

The nations that believed in gods many and lords many, assigned to each a limited and local jurisdiction. It was

* Baccalaureate Sermon, delivered to the Class of 1900, May 13, at the First Presbyterian Church, Berkeley, by the Rev. Chas. R. Brown, Pastor of the First Congregational Church of Oakland.

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supposed that each god had selected his home with reference to the interests he had in charge. He dwelt in a particular spot or region. The early Israelites regarded Mt. Sinai as the residence of their deity. It was "the mount of God," the seat and home of Jehovah where he could be seen face to face.

Along with this notion, and then gradually supplanting it, there came the belief that God lived in houses set apart for His use. To enter the tabernacle, the temple, or the Holy of Holies, was to stand in the presence of Jehovah. He placed His name there, as a man fixes his name upon the door plate of his home, and then "the glory of the Lord filled the house of the Lord."

Still later the divine residence was placed in the skies. When men prayed they said, "Hear thou in heaven, thy dwelling place, and forgive." According to their thought, "the heavens were the Lord's, but the earth He had given to the children of men." God had created this world in the beginning; He occasionally interrupted its ongoings by miracles or special providences, but for the most part He dwelt among the stars and allowed the earth to run itself.

These attempts to find God are no longer satisfactory. They are not productive of the moral help that religion should offer thoughtful men. In the course of man's development, each has dominated the religion of the period, and each may have served a certain end. But to-day we have come to a conception of the divine which is more in harmony with the teaching of the New Testament. It is that suggested in the text—God is here present in the total life of this world. He is more especially resident and powerful in human affairs. The tabernacle of God is with men and He will dwell with them.

With men! With what men? Not with a few saints shut up in cloisters, nor with lonely ascetics living in the desert upon locusts and wild honey! All these, Christ said, are less than the least in the true kingdom of God. The men named in the passage where the text stands are

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city men. They are surrounded with walls hugh and high; they are men of affairs. They carry on the traffic in great values—the mighty ones of earth are bringing their glory and honor into the corporate life. They live in a place of large intelligence—whole nations are walking in the light that shines from this seat of eager activity. They dwelt in a place of joy and beauty—music, precious stones, and trees bearing all manner of fruit are ministering to their pleasure. They are controlled by moral aims—they cast out the things that defile. In the vision of the ancient seer these live, active, efficient people, busily engaged with the great common interests that belong to society, were the men with whom God made His home.

We may say frankly then that God, so far as we know Him, finds His residence in the thick of human affairs. He lives where the people are. His interests are no other than their interests. The old pagan idea of religion was cast largely in terms taken from the relation of master and slave. On one side a despot dwelt apart, recognizing no obligations to his subjects but levying tribute upon them in the shape of offerings, ceremonies, and sacrifices, that were supposed to gratify him. On the other side were slavish worshippers, seeking to placate, to appease, or to cajole their royal tyrant; they held that the obtaining of his favor did not necessarily involve personal righteousness, but it demanded punctilious observance of the ritual of his court.

The new conception of religion is framed altogether in terms that belong to the relation of father and child. The obligations are mutual; the interests are one; the bonds of union are moral. The great Father, from whom every fatherhood in heaven and on earth is named, lives to fulfill Himself through the lives of His children. This world of human interest is no outlying dependency on which He levies tribute, on which He looks down in gloomy severity, which upon occasion He may visit—it is His home. The seer claimed that the whole range of interests that belong

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to human welfare and progress is the place of God's affection, the sphere of His holy activity, the concrete material from which He frames His loving purposes—the tabernacle of God is with men and He dwells with them.

This was the oft repeated teaching of Jesus. He said to the Samaritans who were narrow and local in their conceptions, 'Neither to this mountain nor to that sacred building at Jerusalem shall men go to find the Father. The Father is the indwelling, informing, and uplifting Spirit in all right life. Anywhere and everywhere men worship the Father when they live and worship in the spirit and in the truth.'

And when Jesus sent his servants out to sow his good seed, he told them frankly, "The field is the world." The place where religion is to grow is no holy corner walled in and shut off from the rest of the earth. The tired life of mankind may now and then come into such quiet places to rest and renew its strength, to wash itself clean in fresh baptisms of divine help, and to think soberly upon its definite aims; but it must go and live its real life out in the open where men are struggling and suffering, where they are sinning and dying. The field that furnishes the soil where religion finds material for the expression of its full life is nothing less than the total world. The world indeed where men pray, love, and adore; where they struggle and wrestle together in gaining their livings; where they build houses, bridges, ships, and railroads; where they plow, sow, and reap; where they love, marry, and rear families; where they organize states, enact laws, and make history—this big, powerful, complex thing called the world is the field, Jesus said, where the good seed of religion is to be put down under the surface and made to grow. This field alone is sufficient to furnish the harvest Christ came to reap.

The hope of the future as to high moral aims and true spiritual values, lies in our frank, courageous acceptance of this New Testament thought of the divine. The day when intelligent men could be interested in a God who dwelt away

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in some lonely mountain is gone. The day when they can be brought to worship a God who lives only in sacred buildings and is mainly interested in what goes on there is fast going. The day when they will consent to think of Him as dwelling apart in the skies, whither He seeks to entice men by loosening their interest from earthly affairs ought to go. The world is not a sinking ship from which it is the purpose of God to rescue men by some Gospel raft. In so far as it is a ship at all, it is one that we must learn to sail, to make safe, steady, and comfortable. The fact that it encounters rough seas utters the louder call for efficient seamanship. The thought of willingly abandoning it does not enter the mind of a sound man; he is here to make his voyage and to bear his part in bringing the total life of his race at last into the haven of a thoroughly Christian civilization. The source of the confidence that right-minded and pure-hearted men feel in this large undertaking is suggested in the text. Back of us, above us, and within us lives the One who is responsible for the venture. The home of God is with just such men, and their lofty enterprises are movements of His energy for the accomplishment of His great aims.

I do not need to remind you that men are not interested to-day as they have been in the past in a religion that is local, or mainly ceremonial, or largely celestial. But there has never been a time when they would respond more eagerly or powerfully to a religion that is ethical, practical, terrestrial. Such a religion has in it no less of the divine but it finds the divine where John found it, that is, with men. If God lives with men, then the more we enter helpfully into those movements that are for the well-being of our fellows, the closer do we come to Him. To know Him, not as an abstract philosophical principle, nor as a distant object for holy contemplation, but to know Him by participation in His purposes, by sharing in the energies of His life, and by the fellowship of deeper experience, this is life eternal.

One of the fundamental concepts in modern religion is the unity and continuity of the human and the divine.

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Christ meant it to be. He said their mutual relations were like those of branch and vine. The glory of the vine is revealed in the number and the fruitfulness of its branches, and the salvation of the branches rests back upon their vital connection with the parent vine. The glory of God is to be seen in the extension of the spirit and method of His son Jesus Christ into all the varied activities of human life; and the salvation of every individual life rests back upon its vital union, through reverence, obedience, and love, with the sustaining life of the Father.

We owe a debt to poet and scientist for the way they have interpreted anew the phases of the physical world. The heavens declare the glory of God and the riches of earth show His handiwork in a way undreamt of by the Psalmist. We sit in the sunshine as at the open hearth of a fire kindled by the Father. We walk through the Sierras, seeing in their strength, their stability, and the history of their formation, constant reminders that the Lord is round about His people, and His unhurried, undefeated purposes enfold us like everlasting arms. We regard the breeze that sweeps through a city on a hot August afternoon, cooling the pillow of pain, calling children from petulance to playfulness, and bringing relief to many a weary toiler, as "a compassionate movement of the life of God across the troubled life of man." The world about us is a nobler servant of all the values when it is no longer mere weather and scenery, but has become the home of meaning and purpose.

History needs the same reverent and vital interpretation. I do not mean ancient history nor Hebrew history alone, but the history you and I and all the men about us are making every day. The real presence of the Divine Spirit is not to be found in bread and wine, in relics or holy water, in shrines and buildings, but in men. It is to be found preëminently in those men of intelligence, resolution, and high moral aim who have at heart the well-being of mankind.

I would not limit it to those who become conscious and

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accredited agents of moral progress. Nature secures her ends in many ways. She has for instance steadily in view the fertilization of the plants. It is accomplished now by bees and now by birds and now by the wind. These servants of hers are not conscious of the ends they serve. The wind bloweth where it listeth in apparent unconcern; the bees are drawn by the brightness of the flower or by the sweetness of the honey, bent upon their personal ends. The farmer rests his hope of an abundant crop of clover seed upon the activities of the bumble bees, and while they steadily serve this forward movement in the clover field, they are blind to any values beyond the satisfaction of their immediate desires.

In similar fashion some men crowd and struggle together intent on personal gains but serving all the while wider interests of which they scarcely dream. The demand for strenuous toil as a means of livelihood; the domestic ambitions awakened in a man's breast by the sight of a beautiful woman and the thought of a wife and children; the joyous prospect of standing in a position of influence and emolument in the world of education, politics, or commerce; the sweet gains of pleasure, travel, culture, and recreation that honest effort makes possible—upon all these men are eagerly bent, sometimes without the recognition of the higher values they serve. Where the effort is wholesome it works out results unknown to the bread and butter philosophy of life.

But how much more is added when we become genuinely religious and have a theory of life that holds in view these higher purposes of existence! Imagine the delight that would come to the bees, the birds, and the wind, were they capable of moral consciousness, could they see the place they fill in the growing world of plant life! It is here that religion affords inspiration and moral stimulus to men. Through all these plain necessities and activities of ours, an increasing purpose runs. When we toil, study, strive, and love, we are not looking simply at the things that are seen but at the things that are unseen. The brightness of

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the flowers, the fragrance of their perfume, and the rewarding honey that lies within them are the things which are seen and temporal; but the moral development and the advancement of that kingdom which is to have no end, becomes the great commanding reality which is unseen and eternal.

These common problems which are sometimes called secular—the effort to make our cities clean, safe, and sanitary; the establishment of educational methods that are sound and useful; the settlement of industrial questions in ways that are just and right; the recognition of the fact that business is for the development of men and not men for the development of business—all these are not secular but sacred. These questions touching the health, the intelligence, the general well-being and moral development of human lives, when compared with questions of ritual, ceremony, or technical dogma, stand out as the ones distinctively sacred. It is in these vital movements that serve the human values best that God makes His earthly home, and we come close to Him as we enlist under the leadership of Jesus Christ for this genuine service.

Two men walked away from Henry Ward Beecher's church after a splendid sermon. One of them remarked, "He seems like a man who lives very near to God." "No," replied the other, "he impressed me as a man who is much among the people and who lived close to men." "Well, that is where God is," said the first. Beecher when he pleaded the cause of the slave; when he spoke in England against the sentiment that would have aided in dividing our nation; when he uttered his brave protest against the wooden theology which was hindering the growth of vital religion; and when he sent out his messages of sympathy, comfort, and inspiration to the troubled and burdened, was getting very near the heart of God. The great leaders and the great movements when characterized by intelligence, by high moral aim, and by a sense of the spiritual values involved are never secular, it matters not what sort of building shelters their work. These efforts are movements

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and accents of the Holy Ghost, and they deliver His message to us fresh and living in the tongue wherein we were born.

As representatives then of the higher education, as men and women bent upon knowing the best things that have been said, thought, felt, and done, I ask you to think of the forces, both human and divine, that are to make the world what it ought to be, as already here. You need not ascend into the heavens to bring them down, nor go to the depths to fetch them up; they are already here waiting to be recognized and utilized for human help. God is not saving the world from the outside but from the inside. He is an abiding part of it. He is the sustaining vine that upholds and fills all branches of its life according to their capacity and willingness to receive His aid.

President Eliot, in speaking of the concern that universities feel for the presence and permanence of wholesome religious influence, used these words: "Universities exist to advance science, to keep alive philosophy and poetry, and to draw out and cultivate the highest powers of the human mind. Science is always face to face with God; philosophy brings all its issues into one word—duty; poetry has its culmination in a hymn of praise, and prayer is the transcendent effort of human intelligence."

It was finely said. It came from a large, ripe scholarship, familiar with the forces and problems that will engage your attention as university men and women. It lifts to the highest place of honor that personal acquaintance with the august realities of religion which makes for moral completeness. The religion to which he referred is not something apart from life; it is life itself, nobly lived. It is the new attitude of faith and hope and love that brings the spirit of Christ into the common life. It is the discovery of the divine in this present world, the enjoyment of His aid in these plain affairs, that demand our daily effort. It is the achievement of full-orbed manhood through honest coöperation with this same God who forever finds His tabernacle with men.

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HAWTHORNE AND THE SHORT STORY.*

By Walter Morris Hart.

From the point of view of the student of technique, of literary forms or types, the history of literature presents a series of phenomena probably not unlike those which the evolutionist finds in the material world. Literary development, that is, obviously can not begin with a perfected and highly organized type, like the Epic or the Novel, any more than the history of the animal kingdom can be said to begin with the last result of its evolution, Man. For the modern anthropologist, the proper study of mankind is no longer man alone; the simpler, less highly organized types are important also; the proper study is all the forms of life; it is historical. The analogy holds for the Short Story; if we confine our attention to the work of the modern masters, to the tales of Kipling and Guy de Maupassant, for instance, we shall never understand the type. Our study must be historical. It may, however, be confined to the work of a single author, if this lies midway in the development of the type, early enough to retain the marks of the origin, late enough to give some fairly definite promise of what is to come. These conditions are fulfilled by the work in the three volumes of Hawthorne's Tales. It looks forward and backward; it shows the relation of the Short Story to the Novel and to the Essay; it shows clearly, in form and content, the influence of the Romantic Movement, in Literature, and

* Read before the Fortnightly Club of San Francisco, January, 1900.

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of the Transcendental Movement, in Philosophy; it is not without hints of that perfection of form which characterizes the Short Story of our own day. A study of Hawthorne's work, then, is the study of the Short Story in general.

The relation to the novel is fairly obvious; both are fiction, both narration. The name suggests that brevity is the essential differentia of the Short Story; but this is not the case. I can imagine a Short Story longer than a novel, without confusion of the types. It does not accomplish brevity by compression—by telling the whole story in fewer words; but rather by selection—by discriminating a certain typical incident, or group of incidents, which is critical for the characters concerned. It is not a novel seen through reversed opera glasses; it is part of the material for a novel seen through a microscope, and discovered to have a peculiar organism of its own. Its relation to the novel is not unlike the relation of the Greek to the Romantic Drama. The Greek insists upon the unity of action; and out of the wealth of incident and episode that we find in one of Shakspere's plays, it selects a single incident, the last and most significant of the series; and this it elaborates to the utmost.

It is, moreover, not a lineal descendant of the novel. Short prose fictions are as old as prose itself, but for the origin of the Short Story we must examine the periodical essay of the Eighteenth Century, as we find it in the "Spectator" of Steele and Addison, in the "Rambler" of Dr. Johnson, in the "Citizen of the World" of Goldsmith; and the "Indicator" of Leigh Hunt, early in our own century, seems to have a more direct influence upon Hawthorne. In their portrayal and criticism of contemporary life, in their analysis of motive, in their character sketches, often continued from number to number—as in the case of Sir Roger de Coverley—these essays contributed much to the contemporary birth and development of the distinctively modern novel. Johnson's "Rasselas" has been described as a mere enlargement of a "Rambler" essay, and Goldsmith's "Vicar of Wakefield," as having a similar relation to the "Citizen

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of the World." But the essay did much more than contribute something to the development of the novel; it gave us the Short Story. I imagine the evolution to have taken place somewhat as follows:

In general, the purpose of the essay is to explain something—a steam-engine, a law, a phase of life, a character, an emotion, an idea. Most often, the essay deals with these *in general*, and, since generalities and abstractions are relatively difficult to understand, the essayist often finds it advisable to append concrete examples, in narrative form. If he writes an essay on "Self-Reliance," he enforces it with a story in which the actions of the main character are notable for this quality. The essayist, perhaps, becomes interested in the story for its own sake, develops the main character to something more than a mere personification of self-reliance, adds new characters, places them in an interesting and appropriate setting, introduces subsidiary incidents. The original purpose may, in this way, be at length submerged, though as an original purpose, at least, it always remains; and the story is not to be accounted for without it. Or, to imagine another case, the writer finds that his public has read the illustrative story with greater relish than the essay itself; his next essay will be mainly story. He goes about it in the same way, however; he begins with a conception suitable for an essay; or, if it be narrative material—a series of events—that first interests him, he abstracts from it the principle involved, and expounds this as an introduction to his story. Primarily an essay writer, he is haunted continually with the idea that a mere story cannot be its own justification for existence, that it must be referred to some general principle or abstract conception, and by that succeed or fail. This feeling, now, determines what sort of change shall take place in the incident, singled out of the series in the longer narrative, and held up in the glaring light of the attention. It is shot through and through with that light, until the vital meaning, the spiritual significance, which every event in the material world serves but to body forth,

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becomes clear and evident. All that the numerous incidents of a man's life-time, as set forth in a long novel, may signify—all this will the single incident develop, if we but gaze at it long and steadfastly enough.

Here again the drama offers a suggestive analogy. An important source of the English drama was the so-called Morality, a sort of play in which the Vices and Virtues appeared upon the stage to emphasize, in the action of the play, the superiority of the Virtues, and to enforce certain moral principles. It is not improbable that, from the first, these characters were not for the audience mere cold abstractions. It was not a public of philosophers, but of ordinary men, seeing all things in the concrete. Thus it was for them an easy transition from a Virtue—Justice, say—to a concrete and historical embodiment of Justice—to Aristides. The drama at its height shows the influence of the Morality; Marlowe's "Jew of Malta" is little more than a personification of Avarice, justly caught in his own trap at the end of the play; the Fool in "Lear" is a descendant of the character known as the "Vice" in the old Morality. Literary history repeats itself, then, when the essayist turns story-teller.

I have, for the sake of simplicity, described the process as if it were carried on by a single individual; the individual is here to be regarded as typical of a group; and the process was not a matter of months or years, but of a century. We should expect that writers during this period would not clearly distinguish between the essay and the story, and this turns out to be the case. Even in our own century, this failure to discriminate the two types persists; we find it in Irving, in Poe, in Hawthorne; and to-day, the Short Story still bears the marks of this essay origin.

Irving, indeed, regarded himself as the originator of the Short Story: he was necessarily conscious of it as a distinct type; and yet, as I have said, he was not free from the confusion. He has been called the American Addison; he wrote an exhaustive and sympathetic life of Goldsmith; he stands, therefore, close to these men. His "Salmagundi"

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is an imitation of their periodicals; and he conceived the "Sketch-Book" in the same way. It contains many essays, few stories, and a number of papers that must be placed in the debatable ground between the two.

Hawthorne's conception was similar; he had the feeling that short stories were somehow dependent, that, in order to justify their existence, they must be by some means grouped and moralized. This is evident in his plan for an early volume of stories, which was to be known as the "Story-Teller." His purpose was "to represent a young man of apostolical bent who set out to go from town to town, giving a sermon every morning, while a friend who accompanied him was to relate in public, every afternoon, a story illustrating the text previously discoursed upon by the preacher; the whole affair being announced in each place by posters, much in the manner of a travelling show. It might be supposed that the introduction of sermons in a book of fiction would offer a stumbling-block to success, but Hawthorne avoided this obvious difficulty by merely mentioning the sermons and then giving the stories in full."* Such a plan, I need hardly point out, not only shows a conception similiar to that of the periodical, but, in its accent on the idea, on the moral, rather than on the concrete, external events, which catch the attention of the mere story-teller, it implies the expository or didactic purpose of the essay. The plan was never carried out; but in the three collections which include the bulk of Hawthorne's work in the short story—"Twice Told Tales," "Mosses from an Old Manse," and "The Snow Image, and Other Twice Told Tales" —we may still find its traces. That Hawthorne did not distinguish between the essay, and the pure narrative, purpose, is shown by the fact that, of the eighty-three compositions which these collections contain, thirty-three are actually essays—and this, despite the fact that two of the volumes are deliberately entitled "Tales." With these essays we, of course, are not concerned; let us turn to the stories proper.

* Lathrop, Preface to the Twice Told Tales, p. 9.

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The artist—the typical artist, distinguished from the philosopher, the scientist, the preacher—deals characteristically in the concrete; ths painter's landscape is composed, no doubt, from a varied experience of the world, but all that can be actually present in the picture is concrete trees and houses, sheep and shepherds. In the same way the novelist is interested in the individuals about him—single characters, single events. These may interest him as exemplifying certain laws; but he cares far more for the individuals than for the laws; and it is the individuals that he attempts to transcribe, to reproduce in his book. Life itself, as we all know, is full of inequalities; it is a truism that Nature never repeats herself; no two men think alike, look alike, act alike. It is this very inequality, this waywardness, that gives zest and flavor to existence. How we rebel against any sort of monotony! How mere undisguised symmetry shocks our æsthetic sense! Everyone knows the look of the palaces of Europe, where the chairs are arranged in straight rows—a big one in the centre, two little ones, exactly alike, on either side, and this group balanced by a table and two chairs against the opposite wall. How cold and barnlike and uninhabitable! By the same token, we do not hang our pictures in straight rows, the smallest at one end, the largest at the other, and the rest in ascending series between. In each of these cases, it is the same thing that offends us; the arrangement is artificial; it is not according to nature; it represents an abstraction, like "symmetry," or "ascending series," rather than the inequality and waywardness of life as we know it. Sometimes the artist falls into the same error; he starts with an abstraction, with a logical conception; he does *not* "hold the mirror up to Nature." In so far as he does this, in so far as he fails to express himself completely in the concrete, to give his work the waywardness of life as it is, be becomes preacher, scientist, expositor—what you will; he fails as an artist! Artist though Hawthorne was, he was also by birth a Puritan; he had the Puritan interest in the problems of morality—in

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sin and its punishment, in the struggles of the conscience; he lived, moreover, in transcendental New England; he was a contemporary of Emerson there; philosophy was in the air. The tendency to preach, to philosophize, the tendency to expound an Idea, rather than to transcribe the wayward facts of life, was strong, became at times irresistible. This, for Hawthorne the artist, spelt "failure." I recall a striking example. When Hawthorne was a young man, it appears that one "Mary," whom Hawthorne's son and biographer, Julian Hawthorne, describes with some enthusiasm, as a "social enchantress," a "clever actress," and a "liar," entrapped Hawthorne into a friendship, and finally told him as her champion, that his friend "Louis" had basely wronged her. Hawthorne, in consequence, immediately challenged Louis; but the latter knew the woman, and the thing was explained, and Mary crushed. Presently, Cilley, another friend, was challenged by a Southern political opponent. He accepted the challenge, because Hawthorne had been so ready to fight, and was killed in the duel which ensued. Hawthorne, naturally, was deeply affected; nevertheless, he used the material for a story. It seems, indeed, full of fine possibilities—opportunities for portrayal of contrasting characters, for the exhibition of strong motives, of passion and action, for the elaboration of dramatic situations. And what did Hawthorne do? The Puritan got the better of the artist; he flung aside all this concrete matter; he abstracted just the moral question involved: Is a man guilty of a deed which he plans but does not carry out? Did he go to life, to experience, for details with which to clothe and present this abstract problem? Not a bit of it. All that experience actually gave him was the mechanical device of a peep-show, which he had seen somewhere at a country tavern. This he supposes to be in the hands of Fancy, or Imagination, (he calls the story "Fancy's Show-Box") who, by its means, recalls to an old sinner the events of his past life. The respectable old gentleman protests that he was never guilty of this or that crime. "Not in the performance,

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perhaps, but in thought," Fancy replies, "and your guilt is as great in one case as in the other." Hawthorne, you will readily see, has here defeated his own purpose. For the very title of the story stamps it at once as artificial; events are first chosen for their mere moral value, then brought up by the mechanical device of the show-box; they lack the waywardness of real life. How much more convincing is the true story as Julian Hawthorne tells it. For it is a bit of real life, always far more deeply significant (as, I believe, Hawthorne himself would have admitted), far more deeply significant than any disquisition of the moralist!

One other example is worth citing; in his story of the "Great Stone Face," Hawthorne again began with an idea, and proceeded, like the essayist, to arrange his material in logical order. The plot of the story is something like this: The Stone Face is a peculiar group of rocks near the summit of Mt. Cannon, in New Hampshire, which, viewed from the valley below, closely resembles the vigorous but time-worn profile of some New Englander of long ago. A mother tells her son, Ernest, the prophecy, "that at some future day a child should be born hereabouts who was destined to become the greatest and noblest personage of his time, and whose countenance in manhood should bear an exact resemblance to the Great Stone Face." To see this prophecy fulfilled becomes the great hope of Ernest's life. A simple, obscure husbandman, he becomes a preacher by force of deep thought inspired by continual brooding upon the Face, by holding fast, that is, to a high ideal. In the meantime, he sees Merchant, Soldier, Statesman, Poet, each attempt to fulfill the prophecy, and each one fail. At last, while Ernest is preaching, the Poet sees the resemblance; Ernest himself fulfills the prophecy. But he is humbly unconscious, and still waits for a greater and nobler. The merchant fails because he thinks of his riches alone. The soldier, because his business is to gain fame by killing his fellow-men, not by making them happier. The statesman seeks his own glory at the expense of truth. The poet lacks faith in his

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own ideals. Ernest is humble, simple; thinks not of himself, but of others, is a humble servant of others, true to the ideal of sympathy and love inspired by the Face; after many disappointments, his Faith remains unbroken. He is the true great man. We have, you will have noted, in the attempt and failure of soldier, merchant, statesman, and poet, a series of incidents, arranged in climactic order—like the pictures in the ascending series. Hawthorne himself regretted the artificial structure of this story. It reminds one not a little of the crude narrative of the moral fairy tale. It deals, moreover, with the events of a life-time; it has not the concentrated power of the true Short Story. But further than this, in adverse criticism, one cannot go. Underlying the story, is a noble idea, nobly conceived, and wrought out with all the sincere emotion of the poet. The form thus comes to be inevitable. It is, after all, the form of much of Christ's teaching—the form of the parables. In the story of the Good Samaritan, for instance, we may note the same structure; a certain priest is the first one to see the victim of the thieves; he passes by on the other side; next comes a Levite, who looks at him, but also passes by on the the other side; last comes the good Samaritan, and *he* has compassion on him. This, like the parables of the sower, the vineyard, the ten pieces of money, shows the typical logical structure, the series of similar incidents, arranged in climactic order. Nothing could be better for the purpose—to set forth a truth briefly, in a clear, concrete, portable form. But life itself is as "moral" as any parable, and it is this life itself that we demand that the writer of the Short Story shall transcribe. If we are not convinced of its truth, the story fails; as the Great Stone Face, good as it is, fails because of its artificial structure, and because of its conscious moral purpose.

Thus far, we have considered only *plot*, as affected by the essay-conception; but character is also affected. Hawthorne, it must be borne in mind, lived not only in Puritan, transcendental, New England, he lived in the midst of the

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Romantic Movement as well. One of the chief characteristics of this movement was the revival of interest in the works of the poet, Spenser; and Hawthorne, unconsciously no doubt, a son of his time, shows clearly this influence. The fact that he named his first child, "Una," is eloquent of his admiration of the "Faery Queene." The "Faery Queene" is an allegory; like Christ's parables, and the "Great Stone Face," it is fiction in the service of truth. Its characters are personified virtues and vices, and their relations are logical relations. He was familiar too, with "Pilgrim's Progress," another allegory, and this influenced him in the same direction. Beginning thus with an idea, giving his stories logical structure, with Spenser and Bunyan standing at his elbow, it was practically inevitable that the characters in Hawthorne's tales should be types rather than individuals. We have already seen an example of this in the "Great Stone Face," where the merchant, soldier, statesman, poet have no value or interest of their own, but are significant only as four types of failure. It is interesting to know that Daniel Webster sat for the portrait of the statesman, a portrait here stripped of all individual and peculiarly personal traits. In one of the most charming of the Tales—in the "Snow Image," there is another illustration of this same tendency. The originals of the characters in this story were the writer's own wife and children, and yet the charming domestic warmth and intimacy which it certainly possesses, exist in spite of a certain dimness and coldness in the characters, which seem to stamp them, "manufactured in the study."

What is true for plot and character, is true, finally, for setting as well. Here, I imagine, the strongest influence at work upon Hawthorne was that of Emerson, and the transcendental movement. In the same chamber in the Old Manse, where Hawthorne wrote the "Mosses," Emerson had, but a few years before, written his thin volume on "Nature." For Emerson the ultimate reality is not matter, but mind, spirit. Of this the material world is but an expression, as

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words are the expression of thought. Nature is symbolic, emblematic; its significance is moral, its laws are moral laws. "A noble doubt perpetually suggests itself—whether this end be not the Final Cause of the Universe; and whether Nature outwardly exists. It is a sufficient account of that Appearance we call the world, that God will teach a human mind, and so makes it the receiver of a certain number of congruent sensations, which we call sun and moon, man and woman, house and trade." "Nor can it be doubted that this moral sentiment which thus scents the air, grows in the grain, and impregnates the waters of the world, is caught by man and sinks into his soul. The moral influence of nature upon every individual is that amount of truth which it illustrates to him. Who can estimate this? Who can guess how much firmness the sea-beaten rock has taught the fisherman? how much tranquility has been reflected to man from the azure sky, over whose unspotted deeps the winds forevermore drive flocks of stormy clouds and leave no wrinkle or stain? how much industry and providence and affection we have caught from the pantomime of brutes? What a searching preacher of self-command is the varying phenomenon of health!" For Hawthorne, the world about him must have worn much the same symbolic and moral aspect. Readers of "The Scarlet Letter" will remember many evidences of it there—the rose-bush by the prison door, the armor on the Governor's wall, the scarlet letter in the sky. The title of the tale already mentioned shows the same tendency, and it is characteristic that the idea for it first came to Hawthorne as a suggestion of interpretation of the Great Stone Face as an actual influence in men's lives. The first hint for the story is recorded in the Note-Book of 1840: "The semblance of a human face to be formed on the side of a mountain, or in the fracture of a small stone, by a *lusus naturæ*. The face is an object of curiosity for years or centuries, and by and by a boy is born, whose features gradually assume the aspect of that portrait. At some critical juncture, the resemblance is found to be perfect. A prophecy may be connected."

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If the transcendental influence is thus clearest in the setting of Hawthorne's stories, it is by no means restricted to this. Nature is not mere motionless landscape; it is living and moving; it includes all life. In this larger aspect, including man and his actions, its reality lies for Emerson in its meaning; its central Unity is conspicuous in action. "Words are finite organs of the infinite mind. They cannot cover the dimensions of what is in truth. They break, chop, and impoverish it. An action is the perfection and publication of thought. A right action seems to fill the eye, and to be related to all nature." Evidently the transcendental influence was at work also in shaping the action, the plot, of Hawthorne's Tales, giving it, as we have seen, often an artificial structure, in order to expound as clearly as possible the underlying thought. The Note Books, again, show this tendency. Events in the material world suggested possible plots only when they possessed symbolic significance. This interpretation was sometimes clearly seen, sometimes dimly felt, as in this note: "A person to catch fire-flies, and try to kindle his household fire with them. It would be symbolical of something." The character, too, must, as we saw, stand for something, body forth a thought, be a type.

I have made bold to point out as defects in Hawthorne's work, (as well as evidences of the essay origin), the logical structure of plot, the type instead of the individual character, and the symbolism in the setting, because these affect the reader as something cold and artificial, as being untrue to life, unconvincing, in a word. But Hawthorne would have heard this criticism with equanimity. He cared nothing for verisimilitude; he was satisfied with allegorical truth. No one certainly ever introduced supernatural motives more frankly, more naïvely, with less attempt to make them appear real. Of mere literary artifice he was never guilty. He seems to play with the reader; he leaves him in doubt, at the end, as to whether the thing really happened or not. Did the Snow Image really come to life? Did the ghosts of past governors really march down the

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great stairway of the Providence house, to attend the funeral of British rule? Did young Goodman Brown really see his pious neighbors at the witch meeting in the forest? After all, it doesn't matter very much; in each of these stories the idea is the main thing; events in the material world only serve to body this forth:—the insight of simple faith; the end of British rule; the existence of secret sin. In no case is the supernatural essential to the story; the truth of the story is other and deeper. It was his purpose, Hawthorne tells us in the preface to "The House of Seven Gables," "to mingle the marvellous rather as a slight, delicate, and evanescent flavour, than as any portion of the actual substance of the dish." Thus his work came to have, like the Old Manse, "not quite the aspect of belonging to the material world."

I have already spoken of the influence of Leigh Hunt, and his essays in the "Examiner" and "Indicator": it is in this connection that this can be most clearly traced. Hunt's "Tale for a Chimney Corner" shows the delicate and evanescent play of the supernatural,—the supernatural not convincing in itself, but because of its moral significance. It is worthy of note that the source of Hunt's tale was German; and we find Hawthorne coming more directly under an influence that here reached him only by way of England. Poe, I believe, was the first to point out the resemblance of his manner to that of the German, Tieck. This may, no doubt, be traced in detail in several directions; the German's story of "The Elves," for instance, offers some striking parallels to the "Snow Image." The same "soft light of domesticity" plays over the pages; there is the same vaguely defined and evanescent relation to the supernatural, so delicate that only the idealistic mother and daughter are conscious of it at all, while to the skeptical and dogmatic father, even material proof is not convincing. It is not improbable that Hawthorne got his idea for "Feathertop" from Tieck's "Die Vogelscheuche." But I imagine that the resemblance is not so much a matter of

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detail as of general treatment, of manner. It is nowhere closer, certainly, than in the introduction of this morally-convincing supernatural. Instead of Puritanism, Tieck inherited the romantic traditions of the German forests, and his task was to reproduce, as Carlyle says, "the true tone of that ancient time, when man was in his childhood, when the universe within was divided by no wall of adamant from the universe without, and the forms of the spirit mingled and dwelt in trustful sisterhood with the forms of the sense." Tieck was one of a little group of romantic writers who lived in Jena near the beginning of the century; Fichte, the philosopher, was a member of the same group; it was his philosophy that Carlyle set forth in modified and popularized form in his "Sartor Resartus;" "Sartor," in turn, inspired Emerson. Thus, whether we trace the line through Tieck, or through Emerson and Carlyle, as surely as all roads lead to Rome, we come at length to Fichte and German idealism. Further than this we need not go; the English periodical essay, and, across the North Sea, German idealism, in the eighteenth century, each unconscious of the other, were working together to produce the short story of our American Hawthorne.

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POETRY AND MATHEMATICS.*

By E. J. WILCZYNSKI.

Human minds differ from each other as the leaves of a forest. But while the diversity of the forms of Nature is vast, not one duplicating exactly any other in shape or color, still the different individuals have much in common. The differences between plants of the same species are not in general considered as of much importance. It is not the tendency of modern botany or of modern zoölogy to emphasize even the differences between different species. On the contrary, from the modern evolutionary standpoint, the relations between the different species are far more important, and the distinctions, which certainly exist, appear to be capable of explanation as the result of a gradual process of differentiation. Such seems to be the standpoint of modern science. But it is, to a certain extent, the standpoint of all science. For even before Lamarck, Darwin, Hegel, and Spencer, plants and animals were arranged in groups according to their resemblances. It is likeness which is at the bottom of all classification, for else each individual would form a species by itself.

Science assumes, in other words, a general point of view. It does not care to know about the oak in our front yard, the single individual oak; it studies the oak as a type, the oak as such, the general oak. From the examination of all the individual oaks, the ideal oak is evolved, and it

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is this, not the individual, with which the scientist is concerned. In this respect, science and every-day experience are opposed to one another. For, in ordinary life it is the individual with which we are concerned. Science is of some use in this, because each individual belongs to some species, and if we know the character of the species we know something about the individual; but not that which is characteristic of it as an individual. In a certain sense, then, the scientific point of view loses that which is the most valuable, the personality of the individual. But important as personality is to us, and no matter how highly we may cherish it, it is also of the greatest importance to recognize what is general, what is common to the different individuals. This must be done even in studying personality, for personality is but a variation from the general type, which must therefore be known; while of course, also, in order to study a general type, individuals must first be investigated.

The human mind has never been satisfied with the examination of the objects of the external world. It has loved to contemplate itself ever since the crude Ionic philosophy gave way to Heraclitus, Parmenides, and Socrates. It has found itself its most absorbing and also its most difficult problem. But, in studying itself, it has not always followed this method of seeking relations and resemblances, which it has applied to external objects, as plants and animals. Observing itself, the intellect discovered a strangely complicated combination of conceptions and ideas, and its task has been mainly an analytical one, attempting to sever with the sword the bands which tie them together, as Alexander cut the Gordian knot. It has proceeded anatomically. As the phrenologists rashly attempted to localize the different traits of human character in particular parts of the brain, so, many have found it attractive to speak of the divers faculties of the mind as of so many separate entities, recognizing no relation between them, not noting the points of resemblance but only those of distinction. To persons of this stamp, the mind is as a

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box filled with various objects, having no particular relations to each other, scarcely capable of as much unity as a lady's sewing-bag, the various articles in which have at least a common purpose.

Such would be the standpoint of the individualist, who strongly emphasizes such distinctions as, for instance, between the scientist and the artist. The distinctions are there, but it seems wise to point out the resemblances, which are also there. But this is rarely done, so rarely in fact that most men think that such things as closed domains of thought, which have no point of contact with other realms, actually exist. And because there are so many who think this way, the intellectual world instead of being at peace with itself is in a perpetual state of turmoil. The different phases of the human mind are continually waging war upon each other. It has become almost fashionable for the man of science to speak scornfully of letters and philosophy, and this disdainful feeling is perhaps even more heartily reciprocated by the classical scholar and the metaphysicist.

But if we take the more philosophical standpoint of emphasizing resemblances rather than dissimilarities, we find that most of this conflict is unnecessary, that the divers activities of the human mind, different as they may appear, are essentially one.

But while this thesis is probably not new, it is one that will command continued interest, and any new way of looking at it may not be quite useless.

Probably no two activities of the human mind appear to the unmathematical person to be quite so unrelated as the mathematical and the poetic. If, then, we can, as I think we can, establish a close affinity between these two forms of intellectual power, some progress will have been made, to use a mathematical terminus technicus, toward the demonstration of the general theorem.

The word poetry is to be taken in its widest sense, and, indeed, the word art would perhaps better express my

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meaning. I prefer to say poetry, because this word has often been used in just the general sense in which I wish to take it. We speak of a poetically-conceived picture, of poetry in music, as freely as of poetic verse, beauty and thoughtfulness being perhaps the dominant ideas associated with the word.

This is not the first time that mathematics and poetry have been compared. Kronecker and Sylvester, both mathematicians of the highest rank, have frequently laid claim to the title of poet, or artist, for the mathematician.

That no poet has, so far as I know, ever aspired to the equally high honor of being called a mathematician, is, I think, due mainly to the general ignorance concerning the real nature of mathematics. Goethe has said many unkind things about mathematicians, mainly, I fear, because they treated his theory of colors, upon which he prided himself more than upon his incomparable "Faust," with very little respect. But Goethe was really a mathematician, that is potentially and in a wider sense of the word, only he never knew it. The reason for his grudge against the mathematicians has been made very perspicuous by one of his own sayings. "A mathematician," he asserts, "is very much like a Frenchman. He translates everything into his own language." I fancy that Goethe would not have objected to this so much if he had understood the beauty and power of that language, the most perfect ever invented by the human mind, which is at the same time the pride of mathematicians and the terror of the remaining world. His language makes of the mathematician an aristocrat. He can speak only to his own kind. The rabble cannot understand his wisdom. But I fear that the authority of Kronecker and Sylvester, great as it is, will not alone suffice to convince you that a mathematician is a poet. Moreover it would be unmathematical to ask you to take so serious a proposition for granted, even on such good authority. And so it will be necessary to show in detail why I uphold this theorem. The meanings which I attach

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to the words poet and mathematician will become clear as we proceed. But so much is clear from the beginning, that not every man that writes verse with a certain amount of ease is a poet. As Sir Philip Sidney says in his "Defense of Poesy": "There have been many most excellent poets that never versified, and now swarm many versifiers that need never answer to the name of poets." Cervantes, Shelley, and Wordsworth have expressed the same opinion. Neither is every man who handles a brush and palette an artist, nor every person who manipulates the keys of that much-abused instrument, called by somebody an ivory-toothed monster, a musician. And, on the other hand, there is many a poet who has never defaced an innocent, clean sheet of paper with a rhythmical account of spring and love, many an artist who has never attempted to spoil a canvas, and many a mathematician who has never studied algebra.

The most characteristic power of the poet is, I take it, emotional rather than intellectual. His soul soars upward like the early lark; his imagination is without bound and carries him far, far away from the regions of actual existence, like the magic cloak in a fairy-tale. And, above all, he thirsts for beauty. It thrills and delights him. He lives upon it; and to the true poet beauty is not rare, for else he would have to starve. He is sensible to beauty wherever it may appear; he sees beauty where we others do not; and why? Because it is his nature to do so. Beauty is the key-note of his life, and he can no more help seeking it, and thrilling with delight over its discovery, than a tuning-fork can help vibrating when its key-note is sounded near by. A poet is born and not made. To quote again Sir Philip Sidney: "A poet no industry can make, if his own genius be not carried into it."

But this is all subjective. Added to these qualities there must be another, to make a poet in the ordinary sense. He must have the power to make objective this potential beauty enclosed within his mind. He must be

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able to produce a work which may appear beautiful to others, something born in his own soul and then exhibited to the world. He must materialize the immaterial in concrete form. Matter assumes form under his hands, to use the language of Aristotle. Or, as Plato more clearly puts it, his idea materializes itself so as to become visible. That which is truly real is not the visible incarnation of the idea, but the idea itself. The maker is superior to that which he has made. And, therefore, we must also consider the inner life of a poet as superior to its outward manifestation, and it seems to me that there may be many inward poets who do not and maybe cannot give outward expression to their poetry. Such silent poets, whose utterance is choked by the very wealth of their emotions, exist. The only poem which they write is that of their own life. "Stumme des Himmels," they have been called by Jean Paul Richter; a beautiful and expressive phrase, which deserves to be rescued from oblivion.

But, you will say, am I not disproving my own theory? Is not the mathematician the reverse of all this? Is it not his province to eliminate from the equation all things that do not bear the test of cold, unfeeling logic? What has he to do with emotions and intuition? You think of him as cold, abstract, unfeeling, unimaginative; a calculating machine, and not a man with a warm and noble heart. You think, in fact, that a mathematician is in all things as far removed from the poet as the north from the south pole. He is, you think, a pedant, a dealer in hard facts; useful indeed, like a head of cabbage, but you prefer the rose.

There are some so-called mathematicians who are but calculating engines. But have we not also many makers of verse, claiming to be poets, whose poetry consists merely in a jingle of words without meaning or thought? Is a poor idea made better by saying it in rhythm? Are we to worship a mere form?

Each art has its own way of making manifest to the external world the ideas of the artist, and although the

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idea may be the same the poet will present it differently from the painter or sculptor. Lessing finds that Virgil was right in letting Laocoon utter piercing cries when the serpent attacks him and his sons, but that the sculptor of the famous group was also right in letting him bear the pain in silence. What is proper for one art is not so for the other. Thus the language of each art is entirely its own. But the language of the art is not the art itself. Mozart, Beethoven, and Wagner each filled a great many sheets of paper with dots and dashes, distributed in a very peculiar way upon five parallel lines. I have, however, still to find the man who would claim that these famous composers found a particular fascination in the pastime of making dots and dashes. Everybody knows that these are but symbols for tones, that it is not the notes which make a symphony of Beethoven or a mass of Palaestrina, but that for which the notes stand.

The relation between the musical symbols and real music is just the same as that between mathematical symbols and mathematics. Mathematics has no more to do with Greek and Latin letters than has music with dots and dashes. The dots mean something, and that something is music. A mathematical equation means something, and that something is mathematics. Every equation is a symbol for a thought. It aids us in thinking, but it is only a means and not an end. A verse which has exactly the right number of feet is not really a poem unless it conveys a valuable thought. A system of formulæ also must have this inner meaning in order to be worthy of the title mathematical.

Because so few understand the meaning of mathematical symbols, most persons gain the impression that a mathematician is one who combines and shuffles mysterious ciphers in a wonderful and dexterous manner, almost like a pack of cards. There does not seem to be any poetry about it, only cold thinking, without the warm glow of fancy which is so characteristic of the poet. But this is all wrong. In no field of thought does the imagination play

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so important a part as in mathematics. An unimaginative mind may indeed acquire considerable knowledge of mathematics, as it may also learn a great amount of poetry, but it cannot act productively. The possessor of such a mind can never advance beyond the region into which his master has led him. He can never point the way into new and undiscovered lands in the boundless kingdom of mathematics. It is the imagination which surmises where knowledge is as yet dim, which boldly asserts as theorems facts not yet discovered, which gives the first glimpses of new and unexplored realms of truth. As a flash of lightning in the obscurity of night, dimly illuminating the path of the wanderer, shows him strange and fantastic views, uncertain and distorted, so sudden and unexpected are the inspirations of the mathematical thinker. And, often, only after many vain attempts does he succeed in lighting the steady lamp of judgment, under whose guidance he finally reaches his goal. Whoever has studied the works of the great mathematicians, of Newton and Leibnitz, of Euler, Lagrange, and Laplace, of Gauss, Abel, Jacobi, Riemann, Weierstrass, cannot fail to be convinced that their wonderful creative power was due principally to their magnificent intuition. They knew long before they proved, not in detail, but as a poet knows the story which he is writing, which he may change in many respects as he proceeds. The systematic logical development of a subject comes only after the ground has been cleared by intuition.

While it has been my endeavor to take into account primarily the most essential element of poetry and mathematics, and while I have attempted to show that it is the same in both, namely the idea, there is something else to be taken into consideration. There is a purely formal beauty in a poem, its rhythm. But this also has its analogy in mathematics. A mathematical equation also has, aside from its meaning, a formal beauty, felt I think by mathematicians in a very decided way. They speak of elegant and beautiful expressions, so that the very phraseology is of an aesthetic

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nature. While rhythm is the most important formal element of poetic beauty, symmetry is the dominating formal element of mathematical beauty. But just as a meaningless jingle, although rhythmical, lacks the elements of real beauty, namely beauty of thought, so the real beauty of a mathematical expression lies in its significance and not in its form.

Poetry, it is often said, deals not with what is real. Naked facts are not poetry. When the imagination soars the highest, and when Pegasus is far above the clouds, the poet is in his element. And on the other hand, it is claimed that the mathematician deals only with facts. But this is not so. The conceptions of the mathematician are purely the products of his thought, although they may be, and often are, as are those of the poet, inspired by actual facts. That mathematics deals with truth cannot be doubted, but does not poetry also do this? In order clearly to understand that this is so, it becomes necessary to analyze the idea of truth as understood by the mathematician. Truth to him means simply consistency, freedom from contradiction. Whatever does not contradict itself is true. Reality has nothing to do with it. For the mathematician, for instance, non-Euclidean geometry is as true as the geometry of Euclid, because it is consistent and does not destroy itself by contradiction. The constitution of real, objective space, if there be such a thing, which according to Kant is, to say the least, doubtful, has nothing to do with the truth of non-Euclidean or Euclidean geometry. But we require just the same kind of truth in art. Poetic truth and mathematical truth are identical. It is consistency, and only consistency, which Aristotle demands of the poet in his "Poetics." Unity of action is his great plea, and unity of action we demand nowadays in our dramas. The lesser unities of time and place, about which so much has been written, appear to be but misconstructions of Aristotle's meaning. And there is scarcely a modern play which does not violate them. But unity of action, *i.e.*, consistency,

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must not be violated, if the drama is to be a work of beauty.

In this sense, truth being nothing but consistency, the story of Ulysses and the Cyclops, of Faust and Mephistopheles, of Hamlet, of Odin and Thor, of Tannhaüser and Venus, of Lohengrin and Elsa, are true. And, indeed, what other standard of truth have we? If a story is logical and consistent, although it may deal with fabulous creatures, such as we have never seen, have we even, absolutely speaking, a right to assert that the narrated events did not actually take place. Because we have never seen sphinxes, dragons, and centaurs, it does not follow that they do not exist, although we may be reasonably certain in the feeling that we shall not encounter them in the streets of San Francisco.

But a logical defect in a story always destroys its beauty. We do not approve of improbabilities, and, as Aristotle says, even prefer the probable impossible to the improbable possible. What he means is, that it is lack of consistency that disturbs us, not the conviction of the unreality of the action. This strong feeling, this desire for consistency, is due to the powerful reign of the causal category. Whether we believe with Hume that the relation of cause and effect is but the result of association and experience, or whether we agree with Kant that this relation is *a priori* present in our mind, and purely subjective, is for our present discussion quite unimportant. We certainly all of us feel profoundly convinced that everything which happens has a cause, and is again a cause for other events which follow. Especially strong will this feeling be among mathematicians and physicists. Given the condition of a system of bodies at a certain moment, and given the forces which act upon them, it becomes a purely mathematical problem to determine the condition of the system at any other time. And in the more complicated problems of life and history, there will be few to deny that the law of cause and effect works in the same way. The

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problem is more difficult, but in the mind of the mathematician, it is in principle only an intricate mathematical problem. If all of the laws of biology and sociology which he is convinced are as invariable as those of chemistry and physics, were known, and if the actual condition of the world in its two aspects, mental and physical, were also known at a given moment, he feels certain that it would be only a mathematical problem to predict the course of events for all future time. The world is then a great mathematical problem, unless indeed there should somewhere be a link lacking in the chain of cause and effect. But no such missing link has been found, and it does not seem likely that it ever will be. This doctrine, although perhaps first explicitly formulated by the great Spinoza, is nevertheless almost as old as philosophy itself. I have no doubt that this was the Pythagoreans meant when they said that the world was composed of numbers. This is the harmony of the universe and the music of the spheres. This is also the necessity of Democritos, and it is this thought which has pervaded all of modern philosophy.

Now just as the world as a whole is a mathematical problem, so is every part of it. And every story told by a poet is the solution of a mathematical problem. The problem is stated in the beginning of the story, when the characters and their environment are described. But while in the real world there can be no such thing as chance, all events which appear to be due to chance having really their causes, even if we happen not to know them, in fiction chance cannot be quite excluded. This is so, because outside of the conditions as laid down by the author, there are potentially present all of the forces of the universe, which cannot properly be taken into account. It is as with the motion of the earth around the sun. Taking only these two bodies as the characters of our story, their history is simply and beautifully told by the laws of Kepler. But all of the other bodies of the universe have their effect upon the motion of the earth and sun, and are reciprocally

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affected by them. Strictly speaking, we cannot describe the motion of the earth without describing the motion of the universe. It is like the monad of Leibnitz. The world reflects in its smallest parts all that is, was, or will be. But the effect of other planets and stars upon the relative motion of earth and sun is so slight because of their great distance, that a very fairly approximate history may be told by neglecting their influence. But nevertheless the influence is there. An observer who could determine with absolute accuracy the apparent position of the sun, and who should attempt to explain its apparent motion among the stars merely by the laws of Kepler, would very soon find it deviating from its predicted path. If he did not know of the existence of the planets and of their attraction, the difference between observation and computation would be inexplicable. He would say that Newton's law could not be exact. The earth, he would find, moves nearly as though it were subject to Newton's law, but not quite. Within certain limits, he might say, the earth has a will of its own. And this conclusion would obviously be simply the consequence of his ignorance.

Just so, in fiction, the characters of a story ought to affect each other in a definite and clearly conceived way. Chance, which is really but the effect of non-understood causes, will and must come in. For else we would be confining the characters of the story to their own mutual interaction, which, as in the problem of the earth's motion, is only an approximation. For no man is independent of his environment. But in good fiction chance is kept within its due bounds, and its importance is not exaggerated. We feel this so strongly that we are not willing to have even as strange events occur in a story as we know to occur in actual life. Truth is stranger than fiction. In fiction the improbable appears forced and artificial, for the reason just stated; while in the external world, if strange things happen, we know that there are causes for them. They are strange, but natural.

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As in the example just quoted, it often happens in applied mathematics that difficult problems are solved only approximately. But whenever a faithful and enthusiastic worker has solved rigorously a problem whose approximate solution alone had previously been known, he is rewarded not only by the greater exactitude, but also by the greater beauty of his solution. The deeper knowledge given by the exact solution manifests itself by the greater beauty, internal and external, of the relations involved. The exact solution means absolute consistency and truth. Just so the work of the poet, aside from its form, is more beautiful as it is more consistent, *i.e.*, as it is more true. The deeper the knowledge of a poet, the stronger his intuition, the more nearly does he become comparable to the mathematician. The poetic imagination in its highest form is identical with the highest form of imagination which exists, the mathematical. For mere fancy is not imagination. As Lamb says in his "Sanity of True Genius," speaking of the minor wits: "Their imagination is not active—for to be active is to call something into act and form—but passive, as men in sick dreams. For the supernatural, or something superadded to what we know of Nature, they give you the plainly non-natural."

But when we say that poetry must be true, we imply no praise for the realistic school of art, not at least for its abuses. Truth is consistency. Of course what is real, is also true, *i.e.*, consistent, for else it could not be. And being true, it is also beautiful. But thus we can conclude only that the whole of reality is beautiful, not all of its component parts. For often, taking only a portion of what is and neglecting its relation to the whole, that which alone constitutes its beauty, this relation, is lost. And not only its beauty, but its truth is lost. For truth, defined as consistency, means relation; therefore, without relation there can be no truth. Strictly speaking, there is no truth but the whole truth, and the whole truth is always beautiful.

Thus not every event, not every scene of nature, is

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capable of artistic treatment, not because it is intrinsically unworthy, but because taken by itself it is unbeautiful. Its beauty can only be appreciated if it is understood as a part of the whole. But some things are so full of relations, are so nearly complete in themselves, that they, taken by themselves, are fit objects for the poet or painter.

And although we have purposely left aside all ethical considerations, the unity of truth and beauty which we have attempted to exhibit, might easily have been broadened to include besides the true and the beautiful, also the good. Some broad-minded men have interpreted this to be the real meaning of the Holy Trinity. Certainly this thought is true, and beautiful, and good. It is but an extension of the idea here advanced, that the poet is a mathematician, the mathematician a poet. Both are also priests; both are imperfect, both yearning for truth and beauty; both strive to attain their end by the same intellectual methods: they differ only in language. And as both become more perfect they approach each other. The perfect poet is the perfect mathematician.

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THE ETHICAL IMPORTANCE OF OUR NEW PROBLEMS.*

BERNARD MOSES.

It is always agreeable to know that one has friends, and it is especially agreeable when these friends are at the same time neighbors among whom one has lived and worked for many years. It gives me very great pleasure this evening to be able to suggest to my colleagues from the other side of the continent that one can live in California and not be always lonesome. California, gentlemen of the Commission, is not merely a region of broad wheat fields, of rich orchards and fruitful vineyards; it is a community where the bonds of human sympathy and rational coöperation are drawing the individual members towards a common purpose; it is a land where men grow who share with your fellow-citizens beyond the mountains the sentiments of patriotism and devotion to the common country.

This goodly heritage, men of California, once lay under the dominion of Spain. The beneficent rains that fill our rivers and water our farms once descended for the patriarchal Spaniard. Upon his unbounded fields shone the same sun that to-day pours its golden glory over our hills and valleys. Yet the patriarch and his barbarian dependents and widely-scattered herds were all the land had to show of social achievement. The Californian lived in

*Speech at the banquet given to the Phillipine Commissioners, Palace Hotel, San Francisco, April 12, 1900.

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indolence and unconcern in a land within whose soil and mountains was the latent wealth of an empire. But the community of to-day is animated by a new spirit. It has been joined to a living body, and become vitalized by the blood of a young and powerful nation. The science of politics, like the science of healing, is acquiring great confidence in the process of transfusion. By this process the paralyzed community is revitalized. By this process life in California has come to have a larger significance for humanity than that which marked the days of the old regime. By this process carried out here, the area of cultivation has been extended, and a contribution made to the civilization of the world. What has happened here will happen elsewhere.

Yet what has been done in California in causing barbarism to be supplanted by civilization has not been done in pursuance of a preconceived and consciously devised plan; nor has it been done by men who saw the end from the beginning. Nor, moreover, were all of the motives which inspired the events that made California a part of the Union such as the higher moral sentiments of this generation approve. But to show bad motives is not enough to fix an immortal curse. Texas was taken by the United States primarily to enlarge the field of slavery, and one of the remote consequences of taking Texas was the acquisition of California. The sins of the fathers may indeed descend upon their children and their children's children even to the third and fourth generation, but the hope of humanity lies in the fact that these sins do not constitute an everlasting taint of the race. By the fermentation of the ages the nations that have faith in action are eliminating evil and moving towards a better life. The very foundation of our confidence in the republic is the thought that social purity is the result of social fermentation; that the comparison of divergent policies and the conflict of antagonistic opinions will show us the way that is right.

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The way that is right is the way that, as a nation, we seek. This nation was never more sensitive on its moral side than it is to-day. If we would interest the millions of our countrymen in any question, we must show them that it has a moral bearing. If we would fasten their attention even on a technical monetary question, we must present the question in such a form that it seems to have a moral aspect. We make it appear that a wrong has been done that must be righted. We become the friends or the enemies of a metal dug out of the mountain, and a question demanding a purely financial calculation is thus caught up and carried over the land on the blazing emotions of the people. If men of this nation cry out against a line of public policy, it is because they fear that justice will not be done. When a strong voice was raised against legislation concerning Puerto Rico, it was because men, not weighing all the consequences of the proposed action, feared that the weak and unfortunate inhabitants would continue to be oppressed. If we go to the islands of the seas with nothing better than Spain's contribution to their civilization, the moral sentiments of this nation will find a voice in unmistakable condemnation. On the other hand, for conduct that is wise and righteous and inspired by high ideals, this nation offers a moral support such as was never before manifest in the world. Other nations have been populous; other nations have had powerful armies; but no other nation ever had so large a number of men and women of independent personality; no other nation ever had so large a percentage of its population competent to express free moral judgments. It is this quality that fixes our place in the world; and it is this quality that will be a conspicuous factor in determining our career in the future.

Governmental forms and purposes that have satisfied other nations will not be approved. We shall not repeat the history of other nations, because the new attitude and the new point of view of the individual citizens have given us a new national purpose. Humanity is not spinning

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around in an unvarying circle, but rising with each great revolution to a point of clearer and wider vision. No great and progressive nation is willing at the present time to solve the vital problems of its career, as other nations have solved apparently similar problems. New ideals are leading us to demand new results. In spite of the marvelous creative power and enlightenment of the Romans in matters of law and government, the nation to which we belong would not accept certain solutions which they found worthy of approval. We repudiate with a vigorous denunciation the conduct of governors who plunder the provinces to increase the wealth and brilliancy of the capital. We repudiate the policy of Spain under which the better part of a continent was hampered in its development, in the mistaken notion that thereby the mother country would increase in wealth. Even the plan under which the English in America and Australia swept away the aborigines, although the result may have been inevitable, is not easily accepted by the moral judgment of our generation. As a nation we have moved beyond the ethical point of view occupied by the Romans, the Spaniards, or the Englishmen of the earlier centuries; and for this reason the problems that arise out of our relation to other races demand a new solution. Among the nations of to-day none stands more stoutly for justice, tempered with leniency for the weak, than that to which we belong. Even the most conspicuous imperfections of our social order arise from an extreme solicitude for the individual citizen under authority. If there is a failure of justice in our courts, it is not that the accused is recklessly crushed under the heavy hand of the law; but rather that the law is sometimes tempered by our charity and regard for our fellowmen to spare, where, in strict justice, it might condemn. These national qualities offer the surest guarantees of fair and liberal treatment to all persons over whom the authority of our government extends. A bill of rights and constitutional guarantees have only such value as is given them by the character of

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the nation that stands behind the constitution. It is not the laws which we have written that have made our land a desirable refuge for the immigrant from every quarter of the world, but the character of the nation as displayed in the execution of its laws. The nation's sensitiveness to moral considerations, its charity and leniency towards the individual citizen, and its inability to forget that a man is a man, are worth more to the weak under our authority than all the guarantees or constitutional limitations that were ever written in the books of the law.

No form of institutions, however cunningly devised and carefully elaborated, can insure a righteous administration. For the government of her American dependencies Spain created a system of institutions marvelous in the completeness of their form; yet Spain's administration of these dependencies does not furnish striking examples of either political wisdom or political righteousness. The failure here was a moral failure. The men behind the institutions failed to conceive a proper object toward which the activity or operations of the institutions should be directed. Less complete institutions, with a more rational purpose entertained by the people under them, led the English colonies towards the achievement of power and social prosperity. The form may have been defective, but the spirit was right. Institutions in themselves have no saving power. It is the intelligence, the devotion, the high moral purpose of the nation that must preserve and carry it on to the realization of its high purpose. Without these things beneficent government becomes an impossibility, and nations fall by the way. In matters of religion, faith is the one thing needful; in matters of politics, patriotism is the one thing needful. And the patriotism of the American people is to make impossible the realization of the dreams of the prophets of evil; and, backed by the morality and manhood of this nation, it is to lead us in the way that is right.

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THE TRAVELLING FELLOWSHIP IN GEOGRAPHY.

On April 26, President Wheeler received the following letters, which are self-explanatory:

2221 WASHINGTON ST.,
SAN FRANCISCO, CAL., April 26, 1900.

Benjamin Ide Wheeler, LL.D.,
President, University of California, Berkeley, Cal.;

DEAR PRESIDENT WHEELER:—One year ago I obtained from Mr. T. T. Williams (on behalf of W. R. Hearst, Esq.) the promise of one year's salary or scholarship for a student of the Department of Geography to enable him to make an examination of the raw products, manufactures, transportation methods, commerce, etc., of the Philippines; and from R. P. Schwerin, Esq., Manager of the Pacific Mail Steamship Company, a free passage from San Francisco to Hongkong and return, within one year.

To-day the gentlemen named have renewed their offer. Mr. Schwerin has placed his proposition on file in his office; and Mr. Williams has given me the enclosed letter, which I beg you to receive officially.

* * * * * * * *

Very respectfully yours,
GEORGE DAVIDSON.

THE EXAMINER,
SAN FRANCISCO, CAL., April 26, 1900.

George Davidson, Esq.,
Professor of Commercial Geography,
University of California, Berkeley, Cal.;

MY DEAR PROFESSOR:—Referring to the offer *The Examiner* made editorially last year to pay the support of a graduate of your class who might visit the Philippines and make such reports on raw products, manufactures, trade, commerce, and mines as would be valuable to the interests of San Francisco, would say that *The Examiner* is at all times ready to make good its proposition. We think the suggestion of sixty dollars a month not quite adequate, and will allow the student seventy-five dollars a month for one year.

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Whenever we hear from the University authorities that this proposition is accepted and they will notify us that they are prepared to send such student from your class, we will deposit with the Treasurer of the University, or any other person they may suggest, the sum of nine hundred dollars, being in full for such proposition.

Trusting this will be satisfactory, we remain

Yours very truly,

W. R. HEARST,
Proprietor of *The Examiner*.
By T. T. WILLIAMS,
Business Manager.

In acknowledgment President Wheeler sent the following letters to the gentlemen thus establishing the Travelling Fellowship in Geography:

BERKELEY, May 5, 1900.

MY DEAR MR. WILLIAMS:—Professor Davidson has transmitted to me your very kind letter of April twenty-sixth in which *The Examiner* renews its offer to pay $75 per month for one year to a Travelling Fellow in Geography of the University of California, that a scientific study may be undertaken of the industrial and commercial conditions in the Philippines. You have given wise and timely aid toward a very valuable undertaking. We hope soon to be ready to name the student who, through the public spirit of *The Examiner*, is to enjoy this exceptional opportunity of studying a problem of fascinating interest and of vital concern.

Very sincerely yours,
BENJ. IDE WHEELER,
President of the University.

Mr. T. T. WILLIAMS,
The Examiner,
San Francisco, Cal.

BERKELEY, May 5, 1900.

MY DEAR MR. SCHWERIN:—The University of California deeply appreciates the kindness of your offer of free transportation from San Francisco to Hong Kong and return for the Travelling Fellow of the Department of Geography who is to visit the Philippines in order to study industrial and commercial conditions there. You have given a helping hand to an undertaking which should be productive of much good. I hope soon to let you know the name of the young man who is to enjoy this exceptional opportunity.

Very sincerely yours,
BENJ. IDE WHEELER,
President of the University.

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R. P. SCHWERIN, ESQ.,
Manager of the Pacific Steamship Company,
San Francisco, Cal.

On May 15, 1900, President Wheeler reported to the Board of Regents that he had appointed William Clark Haswell, (B.S., 1900, College of Commerce), Travelling Fellow in Geography.

OFFICIAL ACTION.

At a meeting of the Academic Council held March 30, the following report was adopted:

To the Academic Council:

The Committee appointed, on March 9, 1900, *To consider the advisability of obtaining a proper academic dress for members of the Faculty and the feasibility of introducing this dress this year*, calls attention to the fact that the cap and gown are now worn on official occasions at Harvard, Yale, Columbia, Princeton, Pennsylvania, Johns Hopkins, Catholic University of America, Chicago, Michigan, and many other institutions of learning.

The Committee recommends the following to take effect on and after Commencement of the present year:

I. The academic cap and gown adopted by the *Intercollegiate Commission* in 1895 to be worn; (1) By members of the Faculties at Berkeley, on all public celebrations; (2) By the members of the committee in charge of the examination and by the candidates, at all final examinations for higher degrees. (A respectful recommendation to the Graduate Council); (3) By the recipients of degrees, on the occasion when the degree is conferred. (Subject to concurrence of the Graduate Council); (4) By members of the University, on such occasions as the President of the University may desire.

II. The Committtee recommends the following types as illustrated in Bulletin 13 of the Intercollegiate Bureau and Registry of Academic Costume, filed herewith.

Gowns: For undergraduates, black stuff, type 6, no hood; Bachelors, black stuff, type 6, with hood; Masters, type 6, with hood; Doctors, type 9, with hood.

Members of the Faculties should wear the gowns to which their academic degrees entitle them, provided that all have the right to appear in gowns of type 7, p. 12.

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Hoods: For Bachelors and Masters, as on pp. 3 and 9 of Bulletin 13; for Doctors, type Y-lip on p. 11.

Caps: The Oxford cap as stated on p. 15 to be worn in all cases in conjunction with the gowns, the tassel to be black except in cases of doctors, who may wear gold.

III. The President is requested to inform the Faculties in San Francisco of the action of the Faculties in Berkeley, with the hope that corresponding action may be taken by them.

Respectfully submitted:

M. W. HASKELL,
Chairman.

At a meeting of the Academic Council held May 14, the following report was adopted:

To the Academic Council:

Your standing Committee on Scholarships beg leave to report as follows:

Applications for appointment as Phoebe Hearst, State of California, and Levi Strauss scholars in the University numbered 202, about the same number as were received last year.

Your committee has given most careful scrutiny to the cases presented to it and finds that the number of deserving applicants is considerably in excess of the provision available for their assistance. The criteria upon which applicants must be judged according to the University publications concerning these scholarships are as follows: (1) character, (2) ability and promise as a scholar, (3) pecuniary circumstances and needs. The policy of your committee this year has been in the direction of attaching increased importance to the essentials of character, ability, and promise, and relatively less to pecuniary circumstances and need, because the former essentials are the best surety that the assistance shall minister to highest ends in individual attainment and in public service, and yet no award has been recommended unless the committee was convinced that the need of the applicant was urgent.

UNDERGRADUATE SCHOLARSHIPS FOR 1900–1901.

Phœbe Hearst Scholars:—Reappointed: *Alice Marion Cummings, Senior, Social Sciences, Santa Cruz; May Eleanor Gates, Junior, Social Sciences, San Francisco; Anne Lucia Holmes, Senior, Social Sciences, Riverside; Kate Courtenay Johnston, Senior, Letters, Los Angeles; Rachel Kurlandzik, Senior, Social Sciences, San Francisco. Newly Appointed: †Agnes Frisius, Senior, Social Sciences, Alameda;

*To December 31, 1900.

†From January 1, 1901.

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Katharine Maloy Layne, Senior, Social Sciences, Pomona; Eliza Cross, Senior, Social Sciences, Saratoga; Sally Agnes Dexter, Junior, Social Sciences, Little Shasta.

State of California Scholars:—First Congressional District. Reappointed: William Burt Albertson, Junior, Mining, Buckeye, Shasta County; Louis Albert Elmore, Sophomore, Letters, Santa Rosa; Rose Humann, Sophomore, Social Sciences, Santa Rosa. Newly Appointed: Beatrice Urania Hagmayer, Sophomore, Social Sciences, Cloverdale. Second Congressional District. Reappointed: Minnie Beatrice Bannon, Senior, Letters, Sacramento; Mary Isabel Stockton, Senior, Social Sciences, Stockton; Otto Goldman, Sophomore, Mechanics, Thermalito. Newly Appointed: Eleanor Fay Stilson, Freshman, Chico. Third Congressional District. Reappointed: *Agnes Frisius, Senior, Social Sciences, Alameda: Fanny H. Avery, Junior, Social Sciences, Berkeley. Newly Appointed: †Nina Melissa Farwell, Junior, Letters, West Berkeley; John Morton Eshleman, Junior, Letters, Berkeley; Elizabeth Adelaide Herrmann, Junior, Letters, Berkeley. Fourth and Fifth Congressional Districts (together). Reappointed: Alice Bowman Wright, Senior, Letters, Fourth District, San Francisco; Vincenza Catherine Milledge, Senior, Social Sciences, Fifth District, San Francisco; Gertrude Sutcliffe, Senior, Social Sciences, Fourth District, San Francisco; James Hugh Wise, Sophomore, Mining, Fifth District, San Francisco; Ellen McKay Hensel, Junior, Letters, Fifth District, San Francisco. Newly Appointed: James Clark Blair, Senior, Letters, San Francisco; William John Allen, Sophomore, Social Sciences, Palo Alto; Ella Gertrude Cook, Sophomore, Social Sciences, Campbell. Sixth Congressional District. Reappointed: Frank George Goodenow, Senior, Letters, Los Angeles; Robert Pettinger Stephenson, Senior, Mechanics, Nordhoff; Edna Tullock Owen, Senior, Social Sciences, Santa Barbara. Newly Appointed: Margaret Elizabeth Doherty, Senior, Social Sciences, Salinas. Seventh Congressional District. Reappointed: Flora Genevieve Savage Manchester, Senior Natural Sciences, Tulare; John Nolan Chain, Senior, Natural Sciences, San Diego. Newly Appointed: Ruby Lacey Cunningham, Junior, Natural Sciences, San Bernardino; Clinton Kelly Judy, Sophomore, Letters, Winchester.

Levi Strauss Scholars:—First Congressional District. Reappointed: Jessie Bohall, Senior, Social Sciences, Arcata; Edith Edna Gaddis, Senior, Social Sciences, Santa Rosa; Edith Mabel Kendall, Senior, Chemistry, Manchester. Newly Appointed: John Joseph Mazza, Sophomore, Social Sciences, Nicasio. Second Congressional District. Reappointed: Amy Gertrude Van Deerlin, Senior, Social Sciences,

*To December 31, 1900.

†From January 1, 1901.

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Grass Valley. Newly Appointed: Carlos Parker Griffin, Senior, Mining, Tuolumne Co.; Martha Elizabeth Miller, Sophomore, Social Sciences, Stockton; Mabel Elizabeth Coddington, Freshman, Social Sciences, Auburn. Third Congressional District. Reappointed: Fred Field Goodsell, Junior, Social Sciences, Byron; James Mossin Koford, Sophomore, Social Sciences, Vacaville. Newly Appointed: Florence Trebitt Hudson, Junior, Letters, Niles; Florence Mabel Preble, Senior, Letters, Oakland. Fourth and Fifth Congressional Districts (together). Reappointed: Frank Walter Kerns, Senior, Mechanics, Fifth District, San José; Annie Harriet Allen, Senior, Letters, Fifth District, San Francisco; Monroe Emanuel Deutsch, Junior, Letters, Fourth District, San Francisco; Theobald Percy Bayer, Senior, Social Sciences, Fifth District, San José; Violet Evelyn Beauchamp Baugh, Sophomore, Social Sciences, Fifth District, San Francisco; Flora Adelina Domenica Bacigalupi, Junior, Letters, Fourth District, San Francisco. Newly Appointed: Edward Gustave Cahill, Sophomore, Mining, Fifth District, San Francisco; Anna Herkner, Freshman, Social Sciences, Fifth District, San José. Sixth Congressional District. Reappointed: Walter Wadsworth Bradley, Senior, Mining, Spreckles; Charles Clarence Williams, Sophomore, Mining, Whittier. Newly Appointed: Mary Ellen Hubbard, Junior, Social Sciences, Simmler; Rachel Laurena Steele, Sophomore, Social Sciences, Compton. Seventh Congressional District. Reappointed: Henry Noble Bagley, Sophomore, Chemistry, Merced; Estella Melinda Murdoch, Junior, Natural Sciences, San Diego; Edwin Everett Keyes, Junior, Social Sciences, Warner.

Cornelius B. Houghton Scholar: Florence Eunice Barnard, Senior, Social Sciences, San Francisco.

Respectfully submitted:

E. J. WICKSON,
J. H. SENGER,
E. E. BROWN,
M. W. HASKELL,
G. M. STRATTON,
Committee.

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CURRENT NOTES.

On Thursday, April 26, the final exercises of the Corps of University Cadets were held on the campus. Before the official inspection by Lieutenant Colonel Maus, U. S. A., in the morning, Mrs. Hearst presented the regiment with a new stand of colors made of the finest silk. She accompanied her gift with the following words:

"Students of the University of California:—It is my privilege to place in your keeping this flag of our dear land, to honor it at home and abroad. This stand of colors will, I trust, inspire renewed enthusiasm and love for your Alma Mater, under whose fostering care you are prepared to gain the triumphs of peace. May your fidelity to its ideals bring a largeness of life that will touch the world to its betterment."

The regimental parade and review in the afternoon were followed by battalion and company drills, and battle exercises; and closed with the salute to the national colors.

COMMENCEMENT WEEK.

Commencement week of 1900 opened with a concert by the Stanford Musical Clubs in Hearst Hall on Wednesday evening, May 9. Owing to rain, the Class Day exercises, announced for the next day, were postponed until Saturday; but in the evening the Class of '98 held a reunion at Hearst Hall.

On Friday morning President David Starr Jordan of the Leland Stanford Junior University, addressed a joint meeting of the California Union and the Graduate Club, at Hearst Hall, on "The Freedom of the University." In the evening, through the generosity of Mrs. Hearst, the Commencement Ball was held in Hearst Hall.

On Saturday, May 12, the postponed Class Day exercises

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were given. In the morning the usual pilgrimage to the various buildings was made: at South Hall, Professor LeConte briefly addressed the class on the influence of the University in forming character; at the Library, Mr. H. S. Robinson, the president of the graduating class, on behalf of the class, presented President Wheeler, with a check for one hundred and fifty dollars, to be the nucleus of a Class of 1900 Library Fund, and President Wheeler responded, expressing his appreciation of the gift and the spirit that prompted it; and at East Hall, Miss Alice Duffy presented to Mrs. Hearst the loving cup that had been purchased by the subscriptions of the student body. After the buildings had been visited, the procession moved to the site selected for the first of the new buildings to be erected, the President's house. After prayer by Professor Bacon, Mr. A. J. Cloud spoke for the graduating class and Mr. Arthur Rodgers for the Regents. President Wheeler then read the remarks prepared for the occasion by Mrs. Hearst: "It is peculiarly fitting that the first official act of helping toward the realization of our plan for the greater university should be the laying of a foundation for a home. Around the life of this home must gather those genuine qualities that all will recognize who sit at its fireside; from it must emanate those goodly sympathies that testify without words what is meant by the brotherhood of man; in it must the student find inspiration, and from it must flow those influences most potent in building the spiritual university.

"We who have most at heart the interests of the University of California have no chimerical views in regard to the architectural plans that have been prepared, nor do we overestimate the larger ultimate advantage far beyond the mere material one of having in our midst an enduring expression of beauty and harmony. It is our hope that, as time brings the opportunity, there may rise on these grounds noble buildings ideally adapted to the needs of the ever-broadening domain of thought, investigation, and experiment, not merely for erudition, but for the preparation that

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will ennoble it and take the initiative in the intellectual and moral advance of the years to come."

Mrs. Hearst then turned the first earth with a silver spade, and was followed by the President and representatives of the Regents, the Faculty, and the student body.

The final ceremony of the forenoon was the unveiling of Douglas Tilden's bronze statue of "The Football Players," which had been offered by Mayor Phelan, of San Francisco, as a trophy, and won by the University of California football elevens of 1898 and 1899. Mr. F. G. Dorety, as the representative of the students, and Mr. J. R. Whipple, as the representative of the victorious eleven, spoke in appreciation of Mayor Phelan's generosity.

In the afternoon the extravaganza "Jason and the Golden Fleece" was given by the graduating class in the natural amphitheatre east of the Mining and Civil Engineering Building.

Saturday evening was given up to reunions and banquets; that of the Class of '90 in East Hall, of the Class of '90 of the Hastings College of the Law in San Francisco, and the farewell banquet of the graduating classes at the Palace Hotel, San Francisco.

On the afternoon of Sunday, May 13, the Rev. Chas. R. Brown, pastor of the First Congregational Church of Oakland, preached at the First Presbyterian Church, Berkeley, the baccalaureate sermon, from the text, "The tabernacle of God is with men and he will dwell with them." Rev. 21:3.*

On Monday meetings of the Graduate Council, Academic Council, and Academic Faculties were held in the Philosophy Building; and those who had satisfactorily completed courses in the departments at Berkeley recommended to the Regents for degrees. During the afternoon the graduating class enjoyed the hospitality of Mrs. Hearst at her country residence, Hacienda del Pozo de Verona. In the evening the Alumni of the Medical Department banqueted at the

* See p. 168.

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Palace Hotel, San Francisco; and the Class of '79 held a reunion at the home of Dr. Geo. C. Pardee, in Oakland. The year's work of the Philosophical Union was brought to a close by a lecture in the Philosophy Building by Associate Professor Stratton on "The Spiritual Implications of Psychological Experiments." The discussion was opened by Dr. W. P. Montague and Professor LeConte.

On Tuesday afternoon Rev. Robert J. Burdette delivered the address at the annual public meeting of the Phi Beta Kappa Society; and in the evening the Alumni Association, the Dental Department, and the College of Pharmacy, held alumni banquets in San Francisco.

The thirty-first commencement of the University was held in Harmon Gymnasium on the morning of Wednesday, May 16, 1900. The procession formed between the Library and North Hall, and moved, in double file, around the north end of North Hall to the Gymnasium in the following order: Candidates for degrees, undergraduates, alumni, Faculties, Regents, invited guests, and the President of the University. At the entrance to the Gymnasium the candidates separated into two files, and allowed the rest of the procession to pass through into the building. The Faculties, Regents, invited guests, and the President took their places upon the stage, while the candidates were seated in a section reserved for them. Added dignity and impressiveness were given to the procession and the exercises by the fact that the candidates and the Faculties were in academic dress.

After prayer by the Rev. J. K. McLean, D.D., President of the Pacific Theological Seminary, the President introduced Mr. Edwin Milton Wilder, B.L., of the graduating class of the Medical College, who spoke on The Necessity of Medical Schools in a System of Public Instruction. Mr. Alfred Charles Skaife followed with an address on A Citizen of the University. The Sacrifice of Education was the subject of Mr. Willard Giles Parsons' paper, and Miss Lillie Evelyn Moller closed the list of student speakers with a paper on Life—a Means or an End? President

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Wheeler read a statement for the year 1899–1900,** and then addressed the graduating classes.†

The following degrees were then conferred:

The degree of Bachelor of Science (College of Chemistry) upon:—Joseph Corbett Christensen, Robert Hilliard Collins, Manuel Egnatius Flores, Emma Francis French, James Percy Grant, Gertrude Helen Hampton, Gertrude Longmore, Hugo Gustave Poheim, Alva Jacob Remmel, *William Thompson Skilling, Norman Eugene Smith, Willard Howard Weslar, Clyde Merrill Westcott.

The degree of Bachelor of Science (College of Civil Engineering) upon:—Benjamin Allen Baird, Francis Lucien Burckhalter, Percy Edgar Hicks, William Murray Kerlinger, Henry Hawley Patterson.

The degree of Bachelor of Science (College of Mining) upon:—Albert James Anderson, John William Barnes, William Lee Bowron, Henry Francis Brizard, Joseph Rodney Brown, Lester Byrd Cheminant, Arthur James Crocker, David Goodale, Richard Snell Haseltine, William Halsted Hilton, Byron Everett Janes, William Wallace Mein, Fred Ludwig Morris, John Carroll Nicholls, Edwin Letts Oliver, Roland Letts Oliver, Frank Warner Phelps, John Allen Reid, Dwight Timothy Smith, James Clarence Sperry, Edwin Henry Tracy, Mark Henry White, Cyril Williams, Jr., Alexander Wise.

The degree of Bachelor of Science (College of Mechanics) upon:—Arthur Clarence Babson, Ross J. Brower, *Allan Corey Burdick, *Herbert William Crozier, Godfray DeLisle, Otto Emil Falch, Jr., John James Alexander Hay, James Joseph Kline, Conrad Loring, George Herbert Masters, James Daniel Mortimer, Howard Frederick Munson, William Franklin Neiman, Yoneshiro Shibata, Ray Whitman Simonds, MacDonald Spencer, Herman Newcomb Sulliger, *Nelson Wamsley Thompson.

The degree of Bachelor of Science (College of Agriculture) upon:—Roy Knight Bishop, *Frank Freeman Ellis, Alfred John Smith.

The degree of Bachelor of Science (College of Commerce) upon:—William Clark Haswell, Howard Daniel McCreary, Edward James Talbott.

The degree of Bachelor of Science (College of Natural Sciences) upon:—Gertrude Eudora Allen, Ruth Hebron Armstrong, Otto Bentz, Morris Hoyt Covert, Hosapher Newell Ewer Daniel, Roy Ernest Dickerson, Percival Dolman, Laura Lorine Donnelly, Grace Belle Edson, Saul Epsteen, *Earl Wiswall Garrison, James Brown Herreshoff, Jr., *Adelaide Mary Hobe, *Louise Hamlin Johnson, Alice Kimball, Lillian

** See p. 161. † See p. 163.

* Degree conferred December 26, 1899.

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Nathan, Ella Jane O'Connell, Adel Arta Parker, Euphemia Sinclair Paxton, *Jennie Louisa Powers, Frederick Willson Rockhold, Alma Emma Stockwell.

The degree of Bachelor of Philosophy (College of Social Sciences) upon:—*Corinne Carter, *Caroline Duval Ellsworth, *Charles Edmund Fryer, Frances Hammel Gearheart, Rachel Scott Gilmour, Charlotte Milliken Hoak, *Charlotte Mignon Hoffman, Ray Howell, *Harry Arlyn Linscott, *Isabella Mogeau, *Walter Newman.

The degree of Bachelor of Letters (College of Social Sciences) upon:—Edith Mary Allen, Lawrence Arnstein, Evelyn Kate Aronson, Herbert Wilmarth Bailey, Minnie Elizabeth Boucher, Herbert Lincoln Breed, *Edith Sara Brownsill, Edward Esbern Christensen, Ernest Augustine Clausen, Archibald Jeter Cloud, Ada Emma Conrad, Annie Deborah Coulter, Adeline Belle Croyland, William Henry DeBell, B.S., Ezra William Decoto, Jesse Leroy Dibert, Major Walter Dinkelspiel, Fred Gerber Dorety, Alice Eugenia Duffy, *Julia C. Eppinger, Bessie Lea French, May Everett Green, *George Hillary Harlan, *Victor Hendricks Henderson, Charlotte Anna Henley, Eugene Elbert Hewlett, Herbert Wynford Hill, Daisy Gilene Hinckley, Wilfred Reginald Haughton Hodgkin, Alice Humphreys, Richard Ernest Hyde, Jr., May Noble Jackson, Gertrude Maxwell Jewett, Gertrude Olive Kelsey, Joseph Lorenzo Kennedy, Eugenie Lacoste, Ellen Cameron Lamont, Joseph Vincent de Laveaga, Lydia D. Lawhead, Louise Adra Linscott, Florence Bertha Livingston, Walter Loewy, Estelle Jane Lundy, Eccleston Bowers Marsh, Mary Elizabeth McCabe, Matilda Liesette McCulloch, *Lena Florence McDonald, *Duncan McDuffie, June Laura McGlashan, Elizabeth Davidson McMillan, Dorothy Meininger, Clinton Ellis Miller, *Flora Ernestine Mitchell, Lillie Evelyn Moller, John Robert Moulthrop, Mitchel William Nathan, Anna Josephine Neale, Jeannette Newman, Amelia Helen Newmark, Ernest Warner Oliver, Clarence Warren Peck, Charles Edwin Reith, Mathilde S. Richard, Harrison Sidney Robinson, John Rose Robinson, Alice Jane Rooney, Mable Frances Ruch, May Louise Sellander, Florence Helen Sollman, William Clay Spencer, Agnes Steedman, May Elizabeth Sweeney, Leland Howard Tracy, Fannie Earl Tyrrell, *Nellie Vance, Mamie Cooper Voorsanger, Gertrude Hazel Wachs, William Kennedy White, Anna Ruth Wilder, Mary Grace Wiltshire, Oscar Wolf, Cora B. Young, B.L.

The degree of Bachelor of Arts (College of Letters) upon:—Frank William Aitken, Ernest White Arnold, Fred Goodrich Athearn, Purle Evelyn Bottomes, Harold Cornelius Bradley, Asa Horatio Cogswell, Joseph Oscar Downing, *Lucia Hester Fish, *Helen Augusta Frost,

*Degree conferred December 26, 1899.

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A.B., Noel Hunt Garrison, Bertha Green, A.B., Eleanor Stewart Hammack, Mary Victoria Ernst Harris, Augustus Loring Hart, Jr., Reno Harley Hutchinson, Alegra Hutton, *Alexander Marsden Kidd, Eleanor Irene Lavallee, Edward Walter Lehner, Ivan Mortimer Linforth, Lena May Macaulay, Pearl Marshall, Dora Louise Martin, Willsie Manning Martin, *Margaret Lilian Matthew, Maxwell Latham McCollough, Francis Robert Morrison, Willard Giles Parsons, Amandus John Richard Paulsen, Bertha Sanborn, A.B., Alfred Charles Skaife, *Nannie Fessenden Skimmings, *Sarah Elizabeth Marquand Smoot, *Katharine Stack, *Aimée Steinhart, Grace Adelaide Sullivan, Arthur Gould Tasheira, Ethel Mary Wagner, Fern Eva West, Minnie Ray Wilson.

The degree of Master of Science (College of Chemistry) upon:—Irving Cowan Allen, B.S., (Thesis: A Preliminary Report on the Relative Values of the Fuels used in the Bay District of San Francisco.)

The degree of Master of Science (College of Agriculture) upon:—*Minnie Reed, B.S. and M.S., Kansas State Agricultural College, (Thesis: Structure and Parasitism of a Marine Ascomycete.)

The degree of Master of Science (College of Natural Sciences) upon:—Ralph Erwin Gibbs, B.S., (Thesis: Phyllospadix as a Beach-Builder); Rowe Montrose Hathaway, B.S. (Thesis: On the Hypergeometric Function Expressed as a Double Loop Integral); Yoshisaburo Kuno, B.S. (Thesis: An Adaptation to Long Intervals of v. Oppolzer's Method of Computing a Comet Orbit from Four Places with Short Intervals); *Perley Gilman Nutting, A.B., Leland Stanford Jr. University, (Thesis: On a Null Bolometric Method for the Study of the Functional Variations of the Absorption and Reflection of Radiation).

The degree of Master of Letters (College of Social Sciences) upon:—Knight Dunlap, Ph.B., (Thesis: The Effect of Imperceptible Shadows upon Judgments of Distance); Viva Barbara McArthur, Ph.B., (Thesis: Exemptions from Taxation in the United States); Guenevere Metkiff, B.L., Pomona College, (Thesis: An Attempt to Discover the Genetic Principles of Literary Criticism); Edna Waymire, B.L., (Thesis: The Dramatic Movement in England from 1580 to 1650.)

The degree of Master of Arts (College of Letters) upon:—William Hardy Alexander, A.B., University of Toronto, (Thesis: The Pentasyllabic Endings of the Lucretian Hexameter); Hiram Bingham, Jr., A.B., Yale University, (Thesis: The Growth of American Supremacy in Hawaii); Lolo Margaret Knepper, A.B., University of Idaho, (Thesis: Goethe's Faust in England; being a Discussson of the Attitude of the English Public towards Goethe's Masterpiece); Gifford Horace Greeley McGrew, A.B., Harvard University, (Thesis: History

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of Early High Schools); Eugenie Louise Shaw, A.B., (Thesis: The Second Chorus of the Agamemnon.)

The degree of Graduate in Pharmacy (California College of Pharmacy) upon:—Louis Michael Aguirre, George Washington Beck, Will David Burton, Nathan A. Cahn, Frank Martin Carter, Sanford Warren Cartwright, B.S., Will Stacker Cherington, Warren Hillson Cole, Isaac Henry Cory, Paul Gerald Dorsey, William Charles Eppenhimer, Robert Howard Eveleth, Richard Mitchal Fernald, Emmett Mahew Fowler, Otto George Freyermuth, Warren Florimund Geary, Alfonso Robert Gustave, Gustav Albert Hutaff, Robert Benson Heath, Elsie Bell Higgins, Walter Edward Jackson, Alfred Ben Jacobs, Frederick Schneider Klinkner, Gustave Oscar Klotz, Joseph Jeremiah Mahony, Patric James McGarry, Daniel Newcomb McMillan, George Oliva, Mark Alvin Sawrie, Leo Amandus Schmitz, Harry Christian Stauffer, Frank Marmion Teass, James S. Torrence, Alice Caroline Ward, John Witmer.

The degree of Doctor of Dental Surgery (Dental Department) upon:—Frank Wilson Anderson, Walter Pike Austin, Gottfrid Bergstrom, Julien Rex Bernheim, Daniel Edward Blackburn, Edward James Broad, *Paul Milton Burns, Eduardo Caceres, Thomas Merritt Carmichael, George Harry Casaday, Daniel Henry Cockerton, Philip Stephen Cummings, Alice May Davis, Joseph Horace Doyle, Hubert Crees Eller, Charles Edward Farman, John Howard Finley, John William Ginno, Arthur Earle Hackett, James Lafayette Halsted, Jr., Charles Sumner Hardy, Joseph M. F. Hooker, Francois Louis Marium Hus, Anna Dorothea Joost, David Harrison Leppo, Albert Francis Lucchetti, Frank Michael Madden, Herbert Stanhope Meyer, John Milton McClish, Christopher John Mogan, Edna Fulton J. Moore, Alvah Nevada Morgan, Totaro Hiroshi Ohhara, Daniel Augustus Ostrom, Jr., George Hudson Phillips, Henry J. Phillips, Wallace Wall Reading, Frederick Joseph Rulison, John Hartley Scott, Henry Charles Soher, John Christopher Somersett, Marion Laurence Tobriner, Will Merrill Tryon, Frank Vaughan, Eugene George Woolsey.

The degree of Doctor of Medicine (Medical Department) upon:—Harry Everett Alderson, David Eugene Bacigalupi, Carlotta Ruth Deckelman, Dora Ida Dorn, Ernestine Doychert, Edgar James Farrow, William Harvey, Rutherford Buchard Irones, Elizabeth Frances Joyce, Bernard John Klotz, Samuel Walter Ross Langdon, Jr., A.B., Julia Paulina Larson, Thomas Michael Maguire, A.B., George Jewett McChesney, A.B., Arthur Merrill McIntosh, Tadataro Miyabe, William George Moore, Mary Elizabeth Nolan, Peter Opsvig, A.B., Mathew Denis Pratt, George Frederick Reinhardt, B.S., Raymond John

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Russ, B.S., Louis Victor Saph, B.L., Frank William Simpson, John Francis Sullivan, B.S., George Joseph Sweeney, Theodora Elliott Vassault, Herbert Charles Watts, Emmet Le Roy Wemple, Edwin Milton Wilder, B.L.

The degree of Bachelor of Laws (Hastings College of the Law) upon:—Marion Sargeant Blanchard, Ph.B., Fred Ellsworth Borton, John Friendlander Bowie, Louis Horace Brownstone, Ph.B., Marcel E. Cerf, Ph.B., Francis Byron Clarke, Edwin Ivan Clawiter, Charles Francis Craig, B.L., William Berry Craig, Alvin Buell Crowell, Letus Narcissus Crowell, Francis Herbert Dam, A.B., André Dessouslavy, Wm. Tecumseh Sherman Doyle, A.B., LL.B., Walter Griffiths, M.A., Robert Lee Husted, Charles McFerson Mannon, A.B., David Franklyn McWade, Ph.B., *Joseph O'Connor, B.L., Emil Cornelius Peters, Samuel Russell Rodgers, Ph.B., Ransom Carey Van Fleet, A.B.

The degree of Doctor of Philosophy (College of Natural Sciences) upon:—Walter Charles Blasdale, B.S., M.S. (Thesis: A Chemical Study of the Indument found on the Fronds of Gymnogramme triangularis).

The degree of Doctor of Philosophy (College of Social Sciences) upon:—Jessica Blanche Peixotto, Ph.B. (Thesis: A Comparative Study of the Principles of the French Revolution and the Doctrines of Modern French Socialism, with the Origin and Development of each).

The University Medal was then presented to James Daniel Mortimer of the College of Mechanics.

The following were then commissioned, the names being read by Professor Soulé, Acting Professor of Military Science and Tactics, and the commission being handed to each graduate by the President:—To be First Lieutenant, William Franklin Neiman, William Halsted Hilton, Major Walter Dinkelspiel, John Carroll Nicholls, Jesse Leroy Dibert, Arthur William Goodfellow, Victor Hendricks Henderson, Howard Squires, and John Anthony McGee; to be Captain, Ernest Warner Oliver, William Anderson Scott Foster, Joseph Vincent de Laveaga, George Asa Harker, Jack Dietrich Hoffman, Edward Gerhart Kuster, Arthur Clarence Babson, Arthur Gould Tasheira, Paul Selby, Maxwell Latham McCollough, Roland Letts Oliver, Edwin Letts Oliver; to be Major, Robert Hilliard Collins and Percival Dolman; to be Lieutenant-Colonel, Harrison Sidney Robinson; to be Colonel, John Robert Moulthrop.

The exercises closed with the benediction by the Rev. J. K. McLean.

* Degree conferred December 26, 1899.

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University Chronicle

VOL. III OCTOBER, 1900 No. 4

UNIVERSITY EXTENSION IN ENGLAND.*

By H. MORSE STEPHENS.

As the honor of delivering the opening address of this series of the University Extension courses provided by the University of California for the City of San Francisco has been entrusted to me, I have selected as my topic University Extension in England. It was my fortune to be an Oxford University Extension lecturer from 1890 to 1894, and I can therefore claim to speak with the authority of some experience. But at the same time I have no desire to go into the history or statistics of so well-worn a subject, preferring rather to deal in a purely descriptive fashion with the Extension movement. I shall draw on my personal reminiscences instead of going into elaborate detail from printed sources, and I hope to supplement the published accounts of English University Extension work by dwelling on some of the lesser known features of it.

The idea of University Extension was first propounded in England, and the methods tried there have since been imitated, with modifications, in France, Germany, and the United States. Many universities in America have started courses of University Extension lectures, notably the University of Chicago, which has from its foundation made University Extension an important department of its work;

*A stenographic report of a lecture in the auditorium of the California Academy of Sciences, September 12, 1900.

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but it would appear that upon the whole the Philadelphia Society of Extension, which is not officially connected with any institution of higher education, has done the most successful work. Conditions in the United States have greatly modified the idea of Extension work in this country, and it may therefore be of interest to describe the system in its development in the home of its birth. This is not done with the intention of arguing that the English system ought to be more closely followed in America, for, as a matter of fact, the slavish imitation of European methods in American educational institutions seems to me always to have resulted in harm. The imitation of the English system sometimes recommended in American college education, the imitation of the German system so largely used in graduate work, and the imitations of the systems of other countries in other respects, seem to me fraught with very considerable danger; and in my lecture this evening, in which I will try to describe the way in which the University Extension system works in England, I desire it to be understood that I speak without recommending any base or servile imitation, but with the idea in my mind that possibly some features of the English system, not at present understood, might be considered worthy of study.

It has to be borne in mind that higher education in England forms no part of the work of the State. The Universities of Oxford and Cambridge, the two great centers of the higher education, are entirely independent of the State. They own their own property. They are formed of a component body of colleges each of which owns its own property; and they confer degrees under their own regulations. It is their business to supply higher education to those young men who care to take it; it is their business, and not the business of the State. At the same time the State is perfectly free to interfere with these two great English educational trusts, and accordingly parliamentary commissions have been appointed on more than one occasion which have, by the authority entrusted to them by Parliament,

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caused uses to be made of the property of the colleges and of the Universities of Oxford and Cambridge which the pious founders who bequeathed property to those universities would have been shocked to hear of. The clerical profession of the early educational founders in England, their desire to encourage true religion in its teaching in Oxford and Cambridge, would have been shocked by the apportionment of large portions of the funds of colleges and universities to such purely scientific education as is now encouraged, particularly in the University of Cambridge. It has been considered wise that the wishes of the pious founder should be interferred with, and the legislature has interfered with the wishes of the pious founder accordingly. But the legislature has not dared to confiscate the property or to undertake the direction of the work of Oxford and Cambridge; and it is to be remembered in what follows that these two great universities, which have been foremost in the work of University Extension, have not been forced into that by any effort on the part of the State, and that they have undertaken that work in the belief that by doing so they would increase their usefulness. At the same time, there is not the slightest doubt that the leading men at both universities have largely encouraged University Extension because they have feared that the growth of the power of democracy in England might lead to other encroachments than those that have hitherto been attempted; and undoubtedly one reason of the countenance given to University Extension has been the belief on the part of the authorities of the two great universities that they might thereby extend a knowledge of their work to the people of England.

The two great English universities, not being State institutions, have undertaken the work of University Extension as a piece of benevolence outside their regular sphere. They have not been forced thereto. Since they have undertaken it with the recognition that it is outside the work for which their funds are intended, they have undertaken it on business principles, and have tried to make it

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pay for itself. In this respect the conditions differ from those of the work in this country, in which university education is a part of the functions of the State.

The two great English universities in starting University Extension, started it on business principles with the idea of making it pay for itself. No profits are handed over from the university syndicate, as it is called in Cambridge—delegacy, as it is called in Oxford—no profits are handed over to the universities. On the other hand, the universities spend little or no money in the work of University Extension; University Extension pays for itself.

The first step of the two universities was to appoint, in Cambridge a syndicate, in Oxford a delegacy, to take charge of the work of University Extension. A certain number of professors, tutors, heads of colleges, eminent university men, were formed into a body called in Cambridge the University Extension Syndicate, in Oxford the University Extension Delegacy, which body has a paid secretary who directs the business of what might be called the Central Bureau. I propose first to speak of this central organization, then to go on and speak of the staff of lecturers and the way in which they are organized, then to discuss the formation of the different centers in England which employ University Extension lecturers, and lastly to deal with the sort of education which results.

First, then, in regard to the central organization. The central organization consists of the body of professors, tutors, heads of colleges, and eminent university men, whose business it is to meet as a board and listen to the report of their secretary and to give their most valuable advice in the selection of lecturers. But the real head of University Extension, both in Oxford and Cambridge, is the paid secretary, and in both universities there have been some very distinguished men who have filled the position of paid secretary to the University Extension.

The first Secretary of University Extension at Oxford was Mr. Arthur Acland, who afterwards went into

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Parliament, and for several years was Vice-President of the Committee of the Privy Council of Education, or practically Minister of Education in England. Mr. Arthur Acland was a man who at Oxford had gone into what may be called the business side of education. He was Steward of Christ Church, and in that place showed considerable business ability. He was never a teacher, tutor, or professor. Added to his duties as Steward of Christ Church, which meant the collection and expenditure of the revenues of the college, he was the first Secretary of University Extension at Oxford. Arthur Acland was not in any way, or in any sense of the word, a great scholar. He never pretended to be. But he was a strong believer in popular education. When the history of popular education in England comes to be written the name of Arthur Acland will stand very high, because of the work he did both as Minister of Education, after he went into Parliament, and as the first Secretary of University Extension in Oxford.

After Mr. Acland came Mr. Michael Sadler. Mr. Sadler was a grandson of the famous opponent of Lord Macaulay, and succeeded Mr. Arthur Acland both as Steward of Christ Church and Secretary of University Extension. He was one of the very ablest men of his time at Oxford. He did not go into the work of teaching, but took up the work from Mr. Arthur Acland's hands and proved himself very proficient in the work of organizing the University Extension and building up its centers. It was Michael Sadler who really built up the great Extension centers. Mr. Sadler is well known in some of the Eastern States. He has visited America on several occasions and lectured at Philadelphia and, I believe, at Chicago. The successor of Mr. Sadler is Mr. Marriott, the present secretary, who was for many years a most successful lecturer. In Cambridge the man who made University Extension was Dr. George Forrest Browne, who is now Bishop of Bristol, and who for more than twenty years managed Cambridge Extension. He was in entire sympathy with Mr. Acland and Mr. Sadler, and his term of

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office covered nearly the whole of their period of office at Oxford.

These are the men who really made University Extension in England. There may be one or two others, like Dr. Roberts, of the London Society for University Extension, who should be mentioned in this connection, but the three who have been named were by the delegates at Oxford and the syndics in Cambridge put in charge of the central offices and developed the system. It was their business to keep a list of the University Extension lecturers, to grade them, to make out lists of their subjects, to make out circulars describing the subjects on which they were ready to lecture. Next it is the business of the secretary to make out his yearly report of University Extension to his syndicate or delegacy, as the case may be. Next he has to keep in touch with the different centers, so that when any center in any part of the kingdom writes to him and says "we want a university lecturer," it is his business to know whom to advise to be sent. If they say they want a university lecturer on biology or art or botany or whatever it may be, it is the secretary's business to advise that center who would be a good man. It is his business to go down and look over the center itself and study its needs so that he may send them exactly the right man. Very often a university lecturer may be admirably suited to an audience in a fashionable watering place but unsuited to lecture to workingmen. It is the business of the secretary to understand the needs of the various centers, so as to send them the right man, and he must keep in touch with them. He must listen to their complaints when they make complaints and see that each center is satisfied. He further has the whole handling of the financial business, getting the checks that are sent in to pay for extension lectures by centers. He has the general central work of administration. His most important business is the drawing up of the list of lecturers, the forming of that list of lecturers and the assigning as far as possible of the right lecturer to the right

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center. This is a more difficult matter than might be expected, because the number of centers runs into hundreds, and naturally all the centers want a very popular lecturer at the same time, and it is the business of the secretary to try to furnish popular lecturers in proper doses and to try to make the different centers satisfied with new young men, perhaps giving lectures for the first time. No center likes to have a new young man trying his "apprentice hand" on them, but the new men have to try their "apprentice hands" somewhere; and it is the business of the University Extension Secretary for Oxford to see that the young man gets a fair chance, and that the center that has had a young man to bring in shall next time have a popular lecturer to compensate them. These matters of management require exceeding skill and knowledge of men and in the handling of them; and Mr. Sadler's great title to distinction is in his understanding and skill in handing around his lecturers and in selecting and apportioning them. I think it may be said with justice that the success of University Extension in England has depended almost entirely, not upon the patience of the audiences, not upon the brilliancy of the lecturers, but upon the skill of the men that have been named as the most conspicuous and successful of the University Extension secretaries.

In the work of selecting these lecturers the secretary has largely to rely upon his own acumen. The young man, or middle aged man who wants to deliver University Extension lectures and get some money thereby, applies to the central office; and the central office has to consider whether to encourage him in his application or not. If he seems the right sort of a man for an Extension lecturer he is asked to lecture, and he is tried in one or two audiences. There are two audiences in particular in Oxford which exist largely for the purpose of trying ambitious lecturers upon. One is the Young Men's Christian Association, which has an audience of considerable patience, and the other a very large and important Girls' Normal School, also an exceedingly

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patient audience; and the poor University Extension lecturer at Oxford is tried out on these particular audiences; and if a lecturer lecturing before these classes and in the presence of three or four delegates, who sit behind him and study his gestures and so on, gets their approval and the approval of the secretary and gets safely through, he is then marked down as a University Extension lecturer and gets very many valuable hints given to him from these experienced persons,—which he generally forgets directly afterwards. But he has to go through this ordeal before he is allowed to be a lecturer.

These lecturers are chosen for many purposes, but the lecturer, once started, is afterwards manipulated by the University Extension secretaries. They come from very many different walks of life. Some of the most successful lecturers have been men, who, after leaving Oxford or Cambridge, have gone up to London and gone into business. We have had lawyers whose practice not coming very rapidly, are often fluent speakers and ready to earn a little money, and to that end go into the business of University Extension lecturing. They have been some of the very best. Young literary men who find high class literature far from lucrative, go into University Extension lecturing. Many young men unable to get their degree or fellowship, will take to University Extension lecturing. Some very few university tutors or professors will do a little Extension lecturing; as a rule, however, only on Saturdays, because they are busy on the other days of the week. A few University Extension lecturers are men who have tried to be dons but have not made a success, and are sometimes successful in making excellent Extension lecturers. There are some who are very bad teachers who are admirable University Extension lecturers; and, *vice versa*, there are some very poor lecturers who are admirable teachers. It is the secretary's business to grade them when selected, and get out a list of their subjects, and then to apportion these lecturers, and have them ready to hand around to the expectant centers.

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That brings us to the third point, an examination of the University Extension center. The characteristic point of the University Extension system is the independent growth of these different Extension centers—independent growth; there are no two University Extension centers that are exactly alike in England. In every place where there is a University Extension center it has grown up in a different fashion, and one of the chief interests to the University Extension lecturer in England is the different types he meets in lecturing at different centers. I propose to dwell on a few of the typical university centers, and then to generalize a little upon the great variety found amongst them. By far the most interesting centers are those maintained only by workingmen. Perhaps the most interesting of all are those maintained by the great coöperative societies. Some of you may have heard of the extraordinary importance that has been attained in the later years by these coöperative societies. They have for a long time supplied the workingmen who are members with all the goods they need to buy, not only with groceries and every form of food, but with clothes and so on. In many instances they have got together and owned the mills themselves, thus as far as possible excluding the capitalist and middleman. And where a great number of mills are run by workingmen forming coöperative societies they make it a rule to put aside a portion of their profits for educational purposes. The rest of the profits are returned in various ways to the members of the various societies. A certain portion is always spent upon lectures. Until the University Extension took the field they used to have lectures from lyceum bureaus, as they are called in this country. They used to have lecturers who would go down and talk upon particular subjects. The societies soon found it much better to have lecturers from Oxford who would give a course of lectures; and the coöperative societies have gone further than any other group of men in encouraging University Extension, and much money is spent in hiring lecturers from Oxford.

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Some of you may have seen a paragraph going round in the newspapers to the effect that a Lancashire mill-hand had just gone to Oxford, having obtained a scholarship there as the result of attending University Extension lectures. That is a perfectly possible condition. A young man, if he read over the course prescribed, would be able to fit himself for college, and he would not be the first actual mill-hand who has found his way to the higher education. It is interesting to know that these groups of workingmen are very particular in the subjects which they like to be lectured upon. They are particularly interested in history and economics. They are not very much interested in courses in literature or in art. In science they prefer applied science to pure science. All the workingmen's audiences are not supplied by coöperative societies; in some centers it is done by employers of labor. There is one who every year gives his mill-hands a present of a course of Oxford University Extension lectures. He sends a check to the University of Oxford, the Educational Extension Bureau, to send a lecturer, and all the employees are expected to attend the lectures. Where there is no single employer of that type a group may sometimes get together and a subscription is made up to obtain the lectures.

Another type of University Extension centers which differs very much from that of the workingmen is the center which is formed in English watering places. It would be difficult to find any American resort for rest and pleasure that exactly compares with the English watering place where people live all the year round; such a place as Malvern, for instance. It is a place largely inhabited by widows and grass-widows of officers and soldiers who stay there because it is healthy and because it is cheap: a paradise for ladies, and a great place for girls' schools; and some of these girls' schools and some of these ladies that have families used to subscribe to get University Extension lectures. It was a very delightful course to give. I had to give it one year, and I know it surprised me until it was

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thoroughly explained to me, to find that ninety-nine out of every hundred of my audience were women. The year before I had lectured in Lancashire where ninety-nine out of a hundred were workingmen. At Malvern the Extension center was largely kept up by the family of former officers, such as I have spoken of, and by the big girls' schools which subscribed quite a considerable sum of money, and thus were enabled to give courses of Extension lectures to vary the school curriculum. In other places the University Extension center was worked by ambitious individuals, in connection very often with the church; sometimes they would belong to the Episcopal church, sometimes to other churches. A few ambitious persons would get together and resolve that they would like to have a course of University Extension lectures. The question was how to get the money. Sometimes they begged it, sometimes they gave concerts, sometimes they ran the risk of guarantors and getting money at the doors. It is not safe to take it on that plan. No two centers work in exactly the same way. Certain University Extension centers found that the whole thing depended upon the vigor of one person, sometimes a clergyman, sometimes a lady. In other places the work was carried on by a very well selected committee of public spirited persons, men and women, who worked together and made arrangements in different ways to raise money to get Extension lectures. Every possible combination of these methods and every plan was tried.

Having formed a center, the question was to know how the course of lectures should be brought into touch with the University Extension. A group of persons, say either a group or committee, the Rochdale Society, or whatever it might be, would get together and agree to have an Extension center. They would then have to apply to Oxford to see what it would cost. The Oxford University did not supply Extension lectures for nothing. The University would say, so much, sixty pounds for a cheap lecturer, one hundred pounds for a good one, for a course of ten or twelve lectures.

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As soon as a check for that amount was received the University would send down a teacher. The committee would meet, and they would quarrel over what they would want. Two rival centers sometimes exist in one town as the result of strong contention about a course of lectures or subjects. The University doesn't mind, and it would send down two lecturers, one to the east and one to the west part of a little town. The committee having at last settled upon some subject, would write to the University Extension Secretary to assign them a lecturer. It was his business to try to supply them with the right sort of a lecturer. It is often difficult to settle these things. Some lecturers are in demand in some centers on their merits, and in other places the attractiveness of the lecturer was of no importance. The sort of lecturer demanded differed as greatly as the sort of subject demanded. But through skilful handling on the part of Dr. Browne, or Mr. Sadler, or whoever it might be, the matter would be settled and the lecturer would then be notified that he must lecture at such and such a place at such and such times, to such and such an audience. The University Extension center having got its lecturer, it next arranged for the place where the lecturer was to deliver his lecture. It was generally a public hall of some kind which was to be procured, but sometimes it would be a church room in connection with a church; sometimes a theater. The place having been arranged and connection with the lecturer having been made, the next step was entered upon, and the University Extension Secretary sent down a bundle of syllabi. Under the Oxford Extension scheme it was agreed that no course of lectures should be delivered of which an elaborate syllabus had not been prepared. The lecturer must have a syllabus together with a list of books that could be read in connection with it. In some centers the syllabus was distributed, sometimes it was sold, but the lecturer had to deliver the syllabus, which the Extension center would send out. At the end of each lecture the lecturer had to put down a list of books to be

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read in connection with it. The center in Mr. Sadler's development of the system loaned the books on these courses. The books referred to were perhaps not easily procured. The University Extension center therefore prepared a list of books and sent them down to be loaned out to the persons who were taking lectures, under whatever system might be advised.

Coming down next to the University Extension center lecturers, they are generally welcomed by the secretary of the center and taken and introduced to the hall in which they are to lecture. The lecturer generally had the advantage in starting of knowing that every member of the audience had a syllabus in his or her possession, so that the lines of the lectures were clearly known. He knew that the books he might refer to were to be procured, because these little Extension libraries, as I have said, accompanied each batch of syllabi, and he, after one or two courses, knew pretty well how to handle his audience. Of course every lecture differs in its circumstances. It requires quite a different treatment to lecture to workingmen and watering place people. The most successful lecturers were those who had the knack of handling the most diverse audiences.

This brings me to the last point to be discussed, and that is the sort of teaching given. Heretofore the purely mechanical way in which lectures are handled has been dealt with. I believe one reason why there are so few women's clubs in England compared to the number in the United States is that the ladies who form such clubs in this country are in England very largely interested in University Extension centers. They take special interest in the work and generally are most efficient organizers of University Extension clubs.

We have the lecturer arrived. He is received generally by the secretary of the center, who delivers him to his audience, and he goes on to lecture. The work that he has to do is two-fold; on the one hand, to his big general audience, to the persons who bought tickets and are coming there and

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criticising the lecture because they have paid money, or who have obtained tickets from others, whether wealthy manufacturers, or what not, who have hired the lecturers. All he needs to do is to try to interest them. He has to try to remember that his audience consists partly of persons who have had no opportunity for higher education, partly of persons who from college have gone into business or professions, partly of teachers; and he has to remember that his work is not so much to inform these people as to stimulate them. If he is lecturing on history, he has to remember that various things have been discovered, new ideas worked out since the time these people were interested in higher education, and to try to put them in touch with the newer movements or with the newer development of ideas. To those who never have been to college at all, who have gone straight into business after their school days, it is his business to try to show them what university teaching means. University teaching does not mean the filling up of addled brains with still more things, but showing people how and where to learn things of which they are in need. One's work then is rather to stimulate than to inform. The number of persons living in England who have either never had a university education or to whom that university education, when over, seems to be but mere barren fruit, because they have not been able to build upon the foundation they have laid,—these are the persons who are mainly benefited. The work is stimulative rather than informative. The majority, certainly, of the audiences of the most successful lecturers have been people of this sort: people who do not pretend to work in connection with the lectures but go to listen, and go away perhaps interested,—but they have the next day's daily work to do. The Lancashire mill-hand who has to work a great many hours in the mill wants to be interested and stimulated, but he has no time to continue this work. But, on the other hand, there is ever an inner center in connection with the University Extension audience in England. One may have in a room one hundred people, of whom perhaps

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thirty or forty may be desirous of going into the question more minutely. These form what is called a class. When a University Extension lecturer lectures for the first time he asks those who are desirous of forming a class to remain after the lecture. A class may be from fifty to one hundred, or perhaps thirty or thirty-five, perhaps it may not be over a dozen. The lecturer comes down from the platform and discusses with them by question and answer. He recommends them the books to read, and after each lecture asks them what they have been reading since the former lecture. He tries, if possible, to appoint a class-leader; and usually finds one or two people, generally teachers in the schools, who are ready to continue as class-teachers to teach these people for the first time how to read and to assimilate their reading. As a rule teachers are the best people as class-leaders. They have their classes in the evenings to discuss the lecture and get questions ready to ask at the time of the next lecture, to read the books that were recommended, and sometimes to read papers in connection with the course of lectures that has been given. By far the most interesting work connected with this great movement is this work of the classes. The lecturer will meet them and get to know them by personally encouraging them to read. At the end of the time he will give them an examination paper and from the result of that examination will declare worthy of a diploma from the University of Oxford the persons whose attendance has been regular and who have done the work. Sometimes one gets a set of exceedingly good answers. And it is in going over such a set of examination papers that one realizes that the University Extension work does not mean merely the stimulation of a large number but means also the beginning of a real intellectual life for the small number that form the classes. Those persons having passed the examination do not get university credit at Oxford. I do not go into a technical discussion of the question as to whether they ought to get university credit. At any rate, the university authorities do not allow them to

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have university credit. Lecturers are always to tell people that their diplomas do not help them to the university credit, but they are to tell them also that they would certainly get more out of their college course for having learned how to do university work in a university way, and that they would find their university work easier for having taken university courses. Oxford and Cambridge very zealously believe that the chief value comes not from learning certain things but from living in an academic atmosphere. University Extension work, then, in England, does not help a person towards a degree; it simply makes his work easier if he wants to go to a university. The obtaining of a certificate is of a certain value to one. To teachers it is of a certain value. A teacher who has taken these diplomas is far more likely to get a place than one who had no experience since her days in the normal school; and the simple fact of having a number of these certificates has been found of real value in certain lines of life.

I do not desire to dwell upon the purely lucrative or non-lucrative question of adopting this work, but rather upon the fact that the people who take these lectures, apart from the general stimulative effect, have recently enriched their lives, and are better able to enjoy current literature, and have a better grasp upon the problems that they have to deal with.

But in one or two other ways University Extension work has its advantages. There has sprung up in recent years, in Oxford and Cambridge, summer meetings. The Oxford summer meeting was instituted by a number of University Extension lecturers acting together, enthusiastic people getting together in the summer who had done good work in the University Extension classes, and might go to Oxford and have a sort of debauch of free lectures; and for a certain sum of money they were allowed to go up to Oxford and stay there and listen to all the University Extension lectures. They are true masters there for the time being. You ought to see the busy Extension secretaries of the local

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centers there! They go around and try the new lecturers. You will always find the University Extension secretaries sitting around and taking notes and wondering whether the lecturer will do or not. Many of these people have been helped to go up by the centers themselves, in the way of prizes of free tickets to those who have done the best. The Lancashire millhand who is now a student at Oxford, won this opportunity as a prize from the Rochdale Society as the best student in the courses that had been delivered. These summer meetings are a matter of social interest. A great deal of work is not done, but many acquaintances are formed of different people who are interested in literature and science and art, and they are brought together here, and their interest in such work is deepened and broadened by an actual residence in a university seat and by the study allowed them in the university libraries and the university laboratories.

The Oxford summer meeting is the last seal that has been set to the university movement so far in England. What I have said of Oxford is true likewise in regard to Cambridge. How much further development may be expected is a matter of speculation; whether or not, as has been the case in one place, a University Extension college will become a popular thing. At present there is only one University Extension college where series of University Extension lectures are held; two very wealthy persons, have formed what is known as a university college, and a regular building has been erected in which University Extension lectures are delivered. Whether that sort of thing is going to increase I should think would be doubtful. But at any rate, so far as the history of University Extension in England has up to this time progressed, what it has brought into existence is an exceedingly successful summer meeting; a very keen desire for culture in the minds of many people; a more genuine interest in literature or science or art, or whatever they may desire; and an opportunity for the study in regular university fashion.

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My two last remarks will rather be devoted to what University Extension has killed, than anything else. For one thing, Extension courses have utterly killed the old lyceum bureau. No longer do the people desire to have the casual lecturer with his one or two fine lectures going around and delivering one or two lectures and departing by the very next train. No body of people are going to have lectures of that sort when they know they can get regular courses of lectures with an offer to guarantee that the lecturer is reliable and able. Therefore the lecture bureau is dead, and with that is dead a certain amount of scrappiness in higher education in England. There are now the regular University Extension lectures, sometimes two lectures a fortnight for a period of twenty-four weeks, sometimes eight or ten lectures. These lectures are carried with a regular system, presenting certain work and running through the winter, which serves, not as an occasional scrappy titillation of interest, but as a part of their real work. Apart from this, persons who do the real work in the classes with their leaders, while not caring to read the books that are sent on, find themselves kept in line with the real development of the work that is going on in the centers of thought and in the centers of the work.

The second great result of University Extension after the killing of the spasmodic lecturer, has been the bringing together in a social fashion of all the persons interested in any local center in the work of the cultivation of the mind. I said just now, and I believe it is original on my part, that one of the reasons why you do not find so many women's clubs in England as exist in the United States, is largely due to the fact that the sort of people that form a woman's club in this country form a University Extension club in England. I think it is indubitable that the organization of Extension lectures in England, the building up of Extension centers, has afforded a new means of intercourse among persons who might otherwise not have made each other's acquaintance, and who are interested in questions of

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literature or art or science. That interest often transcends the interest of denominations; even the ministers of different denominations meet together and deal with these questions of Oxford or Cambridge University Extension centers.

A third point, and that is the last, in which the building up of University Extension has done good in England, is that it has made the people of England much better acquainted with their own universities. Nothing has done more to democratize Oxford and Cambridge than University Extension lectures. Before the University Extension lectures found their way all over England there was a sort of idea that universities existed for the purpose of turning out clergymen and an occasional statesman. The idea that universities could direct them had never before entered the minds of the workingmen. Some of them have stated that they first realized the good the university was when the university was able to furnish them traveling lecturers and the means of instruction. Now, the two great universities in England greatly need that movement of democratization. Had they continued in their past organization Parliament would have been quite likely to interfere with their own means of life. As it is, the two great universities are more strongly entrenched in the hearts of the people of England than ever before.

The enormous advantage conferred by Oxford University Extension in advancing the great class that forms our great university centers is so evident that it is surprising that more centers of the sort do not exist in this country. Neither the Philadelphia Extension Society nor the Extension Department of the University of Chicago seems to fill the exact place that University Extension has filled in England in the last five and twenty years. Perhaps the principal reason is that both the Philadelphia Society and the Chicago University are ready to send out lecturers without demanding anything in return. People most value what they have to pay for. Since University Extension in

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England has to contrive and get together to find the means to hire its lecturer, it certainly appreciates him a great deal more than when he was sent down for nothing at all. And in America it will probably be far wiser to have full confidence in the organizing power of the people and to let University Extension come, not as it now sometimes does from a central bureau that sends around asking people, "Are you not looking for lecturers?", offering them lecturers; but from the desire of the people themselves to get acquainted with the modern thought. Then let them know that there is a bureau or center to which they can apply and get what they want, and have a lecturer who is fairly chosen on account of his fitness for that sort of an audience. Surely by such means the University Extension would fill a larger and more important place, certainly when served by men of such fitness for the position as Mr. Sadler and Mr. Acland and others, who spent a great deal of time in trying to fit the right lecturer to the right audience, in trying to discover the thing that people wanted and to get them together. University Extension has been a success in England, and when the time comes, as it undoubtedly must come, when men perceive the fact that it is a good thing to bring the university and the people together,—not in the shape of trying to scatter the university all over the state, or all over the district, but rather in the way of showing the university methods to the people,—and that, if they cannot afford a university course, they can get the sort of persons they want supplied by persons who are experts in finding and supplying such things, then I believe that University Extension lecturing in the United States will kill the lecture bureau in this country, and will supply the means of great educational force for those people who desire to have it, and are so determined to have it that they will find the means to have it and will be ready to pay for having it. The lecturer is worthy of his hire as well as every other form of laborer; and the better type of lecture is not to be secured from the person who, going forth with

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confidence that he can make a good impression on an audience, is ready to hold himself up without being guaranteed or backed in any way from behind.

It is with the belief that this study of University Extension work in England might be at least of interest, though I do not set it forth as worthy of imitation, and because I have set off the difference in conditions that exist here and there, that I have detained you this evening.

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FOUR PHASES OF KIPLING'S WORK.*

By H. Morse Stephens.

I feel a certain diffidence since the talk I propose to have with you this evening has been announced as a "lecture." I do not propose to lecture, but simply to talk, and to illustrate points of my talk by the reading of poems, most of which I know must be familiar to you, but which may perhaps get a little additional significance by the frankness with which I profess myself intending, not to deal with Rudyard Kipling in any form of elaborate lecture, but rather in a sort of subjective account of how I first became acquainted with the writings of that poet, and of the way in which I have been led to believe others have been impressed by the same characteristics. It is part of the irony of fate that, although I profess to be somewhat of a historical student, and make it more or less my business to talk on historical subjects, the unkind world insists that I shall lecture on a literary subject. I know I am no professor of English literature, and I have not and do not pretend to have the slightest right to speak upon a literary subject; and therefore it is in a double capacity that I feel diffident to-night: first, because I have been announced to "lecture;" and secondly, because I have as my subject one so remote from my field as the literary life and career and work of Rudyard Kipling.

*From a stenographic report of an informal talk before the Art Association of the University of California, at Hearst Hall, August 23, 1900.

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In speaking of Mr. Kipling's works to-night I want to clear myself, therefore, of any possibility of being suspected of being a lecturer on English literature. I propose only to try to point out how it is and why it is that Mr. Kipling has especially appealed to me. I believe it to be true that there are thousands and thousands of people in this world who find somewhere in their course through life a particular writer whose thoughts keep them, whose ideas strengthen them. I know of one soldier who, when he goes to the field, always takes in his baggage the Bible and Horace. There are others to whom the cryptic utterances of Robert Browning appeal as being a special help to understanding life better, and to leading it more to their own satisfaction. But I frankly admit that ever since his first appearance on the horizon, it has been the writings of Kipling which have especially appealed to me; and the reasons I can so easily explain that I venture to lay them before you in this study of Kipling's writings.

The first I knew of Mr. Kipling's works was when one of my old school friends employed in the civil service in the Punjab sent me home, copied from the "Civil and Military Gazette" of Lahore, one of those little poems which have since been collected as "Departmental Ditties." It was a pleasure to receive afterwards copies of each of the early poems of Mr. Kipling; and when to his early poems were added his early stories, there came home to me the conviction that there had appeared a man who could explain to the English people, and afterwards, may be, if his genius was great enough, to the world, what the government of India by England meant. To myself, whose family had served in India for four generations, who knew the cost of governing India, who understood in those days the meaning of the "White Man's Burden" as it was borne by those who governed in India, the sudden sounding of this voice explaining to the English people what they had refused to listen to,—the meaning of the government of India, came as a revelation and a source of delight. When

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with the next stage of his evolution Mr. Kipling appeared not only as the exponent of the government of India, in prose and verse, to the English people (I think I may say the English-speaking people), when he appeared as the exponent of the British soldier, as the person who saw beneath the somewhat rough and noisy personality of Mr. Thomas Atkins the real work that the red-coated champion was expected to do, a new chord was touched. On one side of my family my people happened to be soldiers; and the story of the soldier, as told in "Soldiers Three," and the song of the soldier—the song, not of the refined, highly polished soldier, but of the real, rough, raw Thomas Atkins—came home with especial delight and pleasure. And when Mr. Kipling evolved from being the exponent of the government of India and the special laureate of the British soldier, into a preacher of political significance—the very particular preacher, on the one hand, of the doctrine of closer union between the people of the English-speaking colonies and the people of the United Kingdom; and the exponent, on the other, of the meaning of the government of dependencies inhabited by alien races—I felt that the political gospel he was preaching was worthy to be listened to. To those who can remember the foundation of the Imperial Federation League in London, and the first attempt made to regard the English-speaking colonies, not as a source of weakness to be sheared off from the mother country as soon as possible, but as a source of strength to be brought into more intimate connection by the labors of statesmen, I felt that this voice of a poet who realized that a closer union must be obtained by a union of sentiment before it could be obtained by a political scheme, was a voice that specially appealed.

And lastly, it seems to me, the fullest development of Kipling in these latter days has been into the preacher of a gospel. It may not be, indeed, a gospel that everybody needed, but it was a gospel that our college youth in England needed sorely. When I was an undergraduate at

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Oxford, the great force among the undergraduates was the gospel of the beautiful, the gospel of the æsthetic, the gospel of Algernon Swinburne, Oscar Wilde, and the writers of their class. It was in those days that the comic papers made fun of the undergraduates who strove so hard to live up to the height of their blue china. Those were the days I remember. But when in 1892, after an absence of twelve years from college associations, I went back to teach in Cambridge, I found a new spirit among the men. I found that instead of the study of the beautiful, instead of yearning to lead days of lazy langour, a new spirit was breathed among them, and for the first time the reigning spirit among the undergraduates was a spirit of work, a spirit of discipline, a spirit that life was something hard, and that the harder it was, the better a world it was to face. I found that the leading young men of this generation, instead of having their table littered with the poems of Swinburne, were using as their special gospel to help them, to lead them, the poems and stories of Kipling.

It was in this way that my own personal opinion of Kipling slowly and gradually formed in the four cycles which I have endeavored to describe to you. I would be the last to assert that there are not other sides of Kipling's manifold powers of expression that may deserve as great attention as these four sides to which I have drawn your special attention—his love for the sea, his expression of the yearning of a race for a wandering life, his modernity, his feeling for the romance that underlies our machine-ridden times just as clearly as it did in the days of old.

But I propose to-night to deal with him, first, as an exponent of India to the English people, and to the English-speaking people; secondly, as the very special laureate of the British soldier in all his roughness, and at the same time with his underlying sense of the importance of the work which he is doing; thirdly, with his political gospel, dealing on the one hand with the necessity of bringing into closer bonds of union the English-speaking folk, whether

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at home or in the colonies, and, on the other hand, with the duty owed to those alien races which inhabit dependencies which fate has placed under the control of the English crown; and fourthly, I propose to talk somewhat of the more characteristic sides of what I have termed the "gospel" of Kipling, the special message, it seems to me, he has had particularly for youth in these latter days.

Before I undertake, however, the first of the subjects that I propose to take up, one after another, and to illustrate by readings from what seem to me the more characteristic poems, I would draw your attention to the fact that among modern men of letters there has been none since the days of Scott who has shown so much facility in telling his story, in making his influence felt, both in prose and in verse, as Kipling. The extraordinary happiness with which his prose illustrates his verse, and his verse illustrates his prose, deserves, I think, very special notice. In his first poems, the "Departmental Ditties," you will find the same underlying spirit that appears in his first volume of prose stories, "Plain Tales from the Hills." The "Barrack Room Ballads" match the stories of military life in "Soldiers Three." In his more recent stories, as well as in "The Seven Seas," Mr. Kipling dwells upon the two sides of what I have called his "political gospel." Last of all, in the "Jungle Books," those unrivalled allegories which may be used to amuse children, but which contain the deepest of Mr. Kipling's philosophy for grown-up persons, can be found the counterpart of those poems of deeper significance which mark what I have called "the Kipling gospel."

One other reservation I desire to make. I do not intend to speak of Mr. Kipling as an artist. He may be a great artist, or no—it matters not to me. I know that he appeals personally to myself and to thousands of young men. I know that his poetry is helpful, and that is enough. Whether or not his poetry and his prose should be regarded as of the highest artistic excellence, belongs to

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those judges of artistic excellence in literature, who will doubtless find his proper place, or else quarrel over what his proper place will be, for a considerable period to come. I, on the other hand, am not so desirous of dealing with Kipling as the man of letters, the artist, as with Kipling, the man, the preacher. The old Romans spoke truth when they spoke of a poet as a "sacred bard," a person who had something to preach; and Mr. Kipling (possibly it may be a source of weakness as an artist, for all I know) is forever preaching. Even in his early poems, but more particularly in his later poems, and in his later prose, he is preaching all the time. He never seems to write a story simply for the sheer delight of writing. He never seems to write a poem simply because some particular form of verse appeals to him, or because he sees a good opportunity for elegant word-twisting. If he cannot find the right word in the English language, he coins a new one, or adopts a word from some of the numerous technical vocabularies which he has mastered—from the language of the Anglo-Indian, of the soldier, of the engineer. In all these matters, the point that should be kept in mind is that Mr. Kipling cares more for what he has to say than for how he says it; and it is with the "what he has to say" that I am mainly concerned. Kipling should be studied as a living force, for that is what he is in England, at any rate, and, I believe, wherever his works may be read.

It should be remembered that in the first stage of his development Mr. Kipling appeared as the exponent of India to the English-speaking people. For such a task he had certain great advantages. Born in India, spending his early years in India, remaining in India, indeed, until very much later than children are generally kept in that tropical clime, he was sent home to England to pass through a somewhat hurried period of school life, and then returned to India as a journalist. To those who know anything of the government of India, it will be understood that the career of a journalist in a bureaucratically governed country

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is about as good a one for obtaining information as could possibly be imagined. In India practically all the Europeans are officials or soldiers. The government of India rests with the great bureaucracy known as the Covenanted Civil Service, commonly called the "heaven-born." Assisting these one thousand "heaven-born" in their work are various persons belonging to the Uncovenanted Service, men who serve in the Telegraph Department, in the Police Department, in the Forest Department, in the Educational Department; and Mr. Kipling's father belonged to one of these uncovenanted branches. He was in the educational service, and Mr. Kipling, therefore, had a full opportunity of knowing, through his father and mother, something of the inconvenience of not being "heaven-born." He himself did not even get into this outer ring of the various uncovenanted or assistant services, which held the thousand "heaven-born" in the Government of British India. He came out merely as a journalist. Mr. Kipling, it is true, did not graduate from any college. He graduated, it seems to me, from a college in which more valuable experience may be obtained than in any other, the college of journalism. It was in the rough and tumble work of that college that Mr. Kipling obtained something of that knowledge of human nature, and of human problems, of which he has made use. Attached to the staff of the "Civil and Military Gazette" of Lahore, he began to do the ordinary work of getting out an Anglo-Indian paper, and at intervals he was permitted to publish stories and poems which filled the vacant space not occupied by advertisements. In this way his first chance arrived. As a journalist attached in no way to the Government, people were more free in speaking to the young man, more especially as he was born in India, and was better able to understand their points of view than was the ordinary Englishman. Thus Mr. Kipling was able to get a truer grasp than he otherwise would of the life and thought of the people, in whatever department they might be employed. Not only did the people of

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India speak freely, enabling him to make use in his poems and in his stories of especial knowledge of the point of view of the Indian people, but that very shy bird, the English private soldier, would venture to make friends with a young out-at-the-elbows journalist. Private soldiers, who could not speak to their officers on terms of equality, were ready enough to talk to this young man; and thus he had an opportunity of studying Mr. Thomas Atkins. Being sent up as society correspondent to the city of the English Government in India during the hot weather, to Simla, he had an opportunity of studying affairs there. It is difficult to conceive of Kipling as a society correspondent, expected to wait in ante-rooms and make notes of the dresses of the ladies who attended the officers' balls; but that sort of work enabled him to get some knowledge from the outside, and to add to what he had from his father as an uncovenanted servant, of what might be called the bye-ways of official life in India. This knowledge has enabled him in the "Departmental Ditties" and in the "Plain Tales from the Hills" to give a description of the social life of the Indian bureaucrats, which has, to say the least of it, some points that seem deserving of criticism. While in these works Kipling denounces the social shortcomings of the men and women who governed India, yet in those Simla days he was able to understand something of the greatness of the work that was being done in India. In both of these works we see the beginner, the man who is handling his subject for the first time, and since he was still young at that time, he naturally speaks much more sarcastically about his superiors than he would have done had he been older. In the "Departmental Ditties" he is ready to make fun, and does make fun, of persons, of whom, now that in his mature days he understands more of the difficulties of the task of governing India, he speaks with more respect. At any rate, in the "Departmental Ditties" Kipling is mainly making fun of official sinnings; and in the "Plain Tales from the Hills" he is mainly relating tales of flirtation and

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similar amusements among the "heaven-born" in their summer homes at Simla. I do not propose to read many of the early poems, or "Departmental Ditties," but merely to allude to them.

We are very slightly changed
From the semi-apes who ranged
India's prehistoric clay;
Whose drew the longest bow,
Ran his brother down, you know,
As we run men down to-day.

* * * * *

Thus, the artless songs I sing
Do not deal with anything
New or never said before.
As it was in the beginning,
Is to-day official sinning,
And shall be forevermore.

With that introduction Mr. Kipling is able to string together a series of poems, none of them, perhaps, of a very high order of poetry, but with a certain skill in making fun of departments and of officers administrating departments of government. But Mr. Kipling at an early stage perceived that the great difficulty in the government of India by England lay in the fact that England did not know what was going on in India, that the English people were hopelessly ignorant of the problems of the government of India, of the work done in India, of the lives spent in India. Particularly was he aggravated, as all Indian administrators have always been, with the free and easy criticism made by members of the English Parliament, who, going in the cool weather to India, and touring lightly through it, came home and in the House of Commons posed as authorities on Indian questions. These globe-trotters, "G. T's" as they are termed, have always raised the wrath of the official class in India, and Mr. Kipling has impaled one of this sort forever in the poem entitled Pagett, M. P. Pagett, M. P. must always be the type of the visitor in cool weather, ignorant of the difficulties of government in tropical

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climate, who, as Mr. Kipling says, "duly misgovern the land." I propose to read the poem because it brings home a second point in the work that Mr. Kipling has done for the Indian administrators. Kipling begins with one of his admirable mottoes, in which he says:

> The toad beneath the harrow knows
> Exactly where each tooth-point goes.
> The butterfly upon the road
> Preaches contentment to the toad.

After that Mr. Kipling goes on:

> Pagett, M. P., was a liar, and a fluent liar therewith,—
> He spoke of the heat of India as the "Asian Solar Myth;"
> Came on a four months' visit, to "study the East," in November,
> And I got him to sign an agreement vowing to stay till September.
>
> * * * * * * *
>
> We reached a hundred and twenty once in the Court at noon,
> (I've mentioned Pagett was portly) Pagett went off in a swoon.
> That was the end of the business; Pagett, the perjured, fled
> With a practical, working knowledge of "Solar Myths" in his head.
>
> * * * * * * *

Mr. Kipling, it will be seen, is not satisfied simply with making fun of the Indian departments. He had as early as the publication of his first volume realized one of the greatest difficulties that the administrators in India have to contend with (and which, for that matter, the administrators in the Philippines will have to contend with in the future), namely, the misrepresentations that are made in regard to India (and will be made with regard to the government of all tropical countries), by persons who pay brief visits and do not understand the conditions. But while in Pagett, M. P., Mr. Kipling makes fun of the travelled "idiots who duly misgovern the land," he realized fully the intensity of sadness involved in serving in India by those

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Englishmen whose lives have been sacrificed to the service of India. And in a little poem containing five pictures of the dawn, full day, high noon, gray dusk, and black night, Mr. Kipling has dealt with the conditions besetting the English in India at a time when a national holiday called them together. The poem entitled "Christmas in India" seems to contain more fully the pathos of Indian exile than many a poem or prose story that has been written with the definite intention of drawing attention to the pathos of tropical exile.

High noon behind the tamarisks—the sun is hot above us—
As at Home the Christmas day is breaking wan.
They will drink our healths at dinner—those who tell us how they love us,
And forget us till another year be gone!
Oh the toil that knows no breaking!
Oh the *Heimweh*, ceaseless, aching!
Oh the black dividing Sea and alien Plain!
Youth was cheap—wherefore we sold it,
Gold was good—we hoped to hold it,
And to-day we know the fulness of our gain.

* * * * * * *

Black night behind the tamarisks—the owls begin their chorus—
As the conches from the temple scream and bray.
With the fruitless years behind us, and the hopless years before us,
Let us honor, O my brothers, Christmas Day!
Call a truce, then, to our labors—
Let us feast with friends and neighbors,
And be merry as the custom of our caste;
For if "faint and forced the laughter,"
And if sadness follow after,
We are richer by one mocking Christmas past.

But if the work of governing India has, as I think it may be said to have, its own pathos, the pathos of exile, at least something great is done thereby; and in one of his poems Mr. Kipling brings out something that has been done in India, not by the work of the official government, but by the kindness, wisdom, and insight of one woman. I

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remember an Indian civilian telling me that he believed the greatest work the English had done in India was the work started by Lady Dufferin's fund for medical aid to the women of India. He insisted that it was no use to establish good government, no use to establish a good judicial system, no use even to establish that great "Pax Britannica," which prevents the different peoples of India from flying at each other's throats, if the civilization of India was to be regarded as belonging to one sex only, and if the seclusion and ignorance of the women was to be perpetually maintained. It was through missionary endeavor that efforts were first made to bring medical aid to the women of India. But many of the men of India were jealous of the possibility of missionary women having access to the zenanas. Lady Dufferin, wife of the greatest viceroy of modern times, founded a fund for medical aid to the women of India. This aid is given without denominational ends in view, simply to supply women doctors for the women of India. In order that this fund may prosper, it is necessary that it should be placed on a strictly undenominational basis. Some of the medical women in India are Americans, and in one of his prose stories Mr. Kipling has dealt with the peculiar difficulties and dangers that beset the labors of white women endeavoring to help the Indian women in this way. The story called "The Naulakha" is a description of an American girl, who, having passed her examinations, went out to India to serve in one of the hospitals, and the work she tried to do there.

The "Song of the Women," supposed to be addressed to Lady Dufferin by the women of India, begins:

> How shall she know the worship we would do her?
> The walls are high, and she is very far.
> How shall the women's message reach unto her
> Above the tumult of the packed bazar?
> Free wind of March, against the lattice blowing,
> Bear thou our thanks, lest she depart unknowing.

* * * * * *

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Haste, for our hearts are with thee, take no rest!
Loud-voiced ambassador, from sea to sea
Proclaim the blessing, manifold, confest,
Of those in darkness by her hand set free;
Then very softly to her presence move,
And whisper: "Lady, lo, they know and love!"

But if, in such a poem as that, Mr. Kipling has pictured something of the sort of work that Europeans, and especially European women, may be able to do for India, in the last brief poem of the first volume that I propose to read, he has grasped something of the magnitude of the Indian empire as it stands to-day. The little poem which I include in this portion of my subject is called "The Overland Mail." It contains a picture of the carriage of the mails as they are brought up the Himalayas to the seat of the government at Simla:

In the name of the Empress of India, make way,
O Lords of the Jungle, wherever you roam.
The woods are astir at the close of the day—
We exiles are waiting for letters from Home.
Let the robber retreat—let the tiger turn tail—
In the Name of the Empress, the Overland Mail!

* * * * * * *

Is the torrent in spate? He must ford it or swim.
Has the rain wrecked the road? He must climb by the cliff.
Does the tempest cry "Halt?" What are tempests to him?
The Service admits not a "but" or an "if."
While the breath's in his mouth, he must bear without fail,
In the Name of the Empress, the Overland Mail.

The second sphere of Mr. Kipling's work grows naturally from the first. Mr. Kipling first, as I have said, tried to explain what India meant to England and those who govern it. But the power of England in India depended in a very special degree and way upon the strength of the English army in India. The red-coated soldier in England is not a very popular person. It is a national habit to belittle the soldier in favor of the sailor. The sailor is the popular figure in all English life. The private soldier in

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time of peace is apt to drink more than is good for him, and when he is drunk he does unpleasant things—breaks windows and smashes things generally. The result is that Thomas Atkins is not a very popular person in England, or was not until Mr. Kipling explained what worked beneath the breast of the soldier. The soldier in time of peace is not a person to be respected, unless you consider the potential value of him in time of war. In India the soldier means a different thing, for the 75,000 white soldiers form the definite basis of the government of those one thousand civilians over those three hundred million people. It is upon the white soldiers, in the last resort, that the force of England rests, and therefore the British soldier in India is a very different creature from the British soldier in England. Mr. Kipling had the advantage of seeing the soldier in India, where, as I have said, he meant empire. He looked beneath the outer crust, and perceived that the two great virtues, which, as I have tried to point out, underlie much of Mr. Kipling's own gospel,—faithfulness to work and obedience to discipline—are the alpha and omega of a soldier's duty. In explaining this, he was able to get into close touch with the soldier, to pardon a certain looseness of speech, and possibly a certain noisiness of manner at times, and always to strike these two main virtues which underlie all this rudeness,—his faithfulness to work and obedience to discipline. In his prose stories Mr. Kipling has dealt with the private soldier in various forms, especially in the stories containing the adventures of the immortal three, Jock Learoyd, Stanley Ortheris, and Terence Mulvaney. In the "Barrack-Room Ballads" he has put into verse some of his ideals of the soldier. These ballads are all of them in Cockney dialect, and it is good Cockney at that. As a rule, dialect writers will slip down now and again, but it is difficult for a Londoner like myself to find many slips in Mr. Kipling's Cockney. The poems I have picked out as illustrating the British soldier best are the "Soldier an' Sailor Too" and a very expressive one to which he gave the

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title of "The 'Eathen." In the "Soldier an' Sailor Too" Mr. Kipling sets forth that part of his doctrine which I have called the gospel of work. The poem was written just after the running down of H. M. S. Victoria in the Mediterranean some years ago. When the Victoria was rammed, the story went that the "Jollies," as the Royal Marines were called, fell in on deck and went down without breaking line. That is called the "Birkenhead drill," because at the time of the loss of the transport Birkenhead all the soldiers on board fell in while the women and children were being taken off, and remained in line until the ship went down. That is what they call in the service the "Birkenhead drill," the attention to duty on board ship even when sinking is imminent. The only other thing in this poem which I think needs a word of explanation is the expression "onion guards," which Mr. Kipling makes use of. It is the name the Grenadier Guards go by in London, because they have embroidered on the shoulder a picture of a hand-grenade, which looks much more like an onion than anything else the average Cockney is acquainted with. The language of Thomas Atkins not being very refined, the language of the "Barrack-Room Ballads" is not very refined.

* * * * * * *

To take your chance in the thick of a rush, with firing all about,
Is nothing so bad when you've cover to 'and, an' leave an' likin' to shout;
But to stand an' be still to the *Birken'ead* drill is a damn tough bullet to chew,
An' they done it, the Jollies—'Er Majesty's Jollies—soldier an' sailor too!
Their work was done when it 'adn't begun; they was younger nor me an' you;
Their choice it was plain between drownin' in 'eaps an' bein' mashed by the screw,
So they stood an' was still to the *Birken'ead* drill, soldier an' sailor too!

* * * * * * *

The other Barrack-Room Ballad that I propose to take is called "The 'Eathen." It is the history of the growth of a

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recruit in the British army up to being a color sergeant. It contains incidentally a good many hints how to be a good color sergeant, which is very much the same as being a good leader of men anywhere.

* * * * * * *

The young recruit is 'aughty—'e draf's from Gawd knows where;
They bid 'im show 'is stockin's an' lay 'is mattress square;
'E calls it bloomin' nonsense—'e doesn't know no more—
An' then up comes 'is company an' kicks 'em round the floor!

* * * * * * *

The young recruit is silly—'e thinks o' suicide;
'E's lost 'is gutter-devil; 'e 'asn't got 'is pride;
But day by day they kicks 'im, which 'elps 'im on a bit,
Till 'e finds 'isself one mornin' with a full an' proper kit.

* * * * * * *

An' last, a Color-Sergeant, as such to be obeyed,
'E leads 'is men at cricket, 'e leads 'em on parade;
They sees 'em quick an' 'andy, uncommon set an' smart,
An' so 'e talks to orficers which 'ave the Core at 'eart.

* * * * * * *

An' when it comes to marchin' he'll see their socks are right,
An' when it comes to action 'e shows 'em 'ow to sight;
'E knows their ways of thinkin' an' just what's in their mind;
'E feels when they are comin' on an' when they've fell be'ind.

* * * * * * *

The 'eathen in 'is blindness bows down to wood an' stone;
'E don't obey no orders unless they is 'is own;
The 'eathen in 'is blindness must end where 'e began,
But the backbone of the Army is the noncommissioned man.

* * * * * * *

The third stage into which Mr. Kipling almost inevitably grew from being the exponent of India and the exponent of the British soldier, was due to the fact that he was able to get a wide idea of that rather large force in this world's civilization called the British Empire. This he obtained from two sides. On the one hand, as he had been born in India, he was able to realize what the government of dependencies meant. The poem in which he has most

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clearly explained the meaning and aim of the government of dependencies is that long since hackneyed poem "The White Man's Burden." I do not propose to read it, because it has become too painfully hackneyed. I propose, as illustrating that insight which Mr. Kipling has into the meaning of England's government of her dependencies, to read a less-known poem entitled "Kitchener's School." You may remember how Lord Kitchener at last wiped out the disgrace of the death of Gordon; how after twelve years of patient waiting he made the army, made the march, and at last stood in triumph at Khartoum; how Lord Kitchener, having celebrated a great funeral service for Gordon in the presence of the troops, hurried home to London and asked the English people for 150,000 pounds to build a college to be erected in honor of General Gordon at the place where he fell. That was an exhibition of what I have called the spirit of dependential government. Having founght his fight, having wiped away the disgrace of the desertion and death of Gordon, Kitchener immediately siezed upon his personal popularity resulting from his victory, to win a sum of money which should enable the dependential government immediately to teach the people of the Soudan how to make the best use of the soil, how to attain to the knowledge which the English have. The poem entitled "Kitchener's School" purports to be a translation of a song written by a Mohammedan schoolmaster when he heard that the Sirdar was collecting money from the English to build a Madrissa for Hubshees—a college for the Soudanese.

Oh Hubshee, carry your shoes in your hand and bow your head on your breast!
This is the message of Kitchener who did not break you in jest.
It was permitted to him to fulfil the long appointed years,
Reaching the end ordained of old over your dead Emirs.

* * * * *

Knowing that ye are forfeit by battle and have no right to live,
He begs for money to bring you learning—and all the English give.
It is their treasure—it is their pleasure—thus are their hearts inclined.
For Allah created the English mad—the maddest of all mankind!

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They do not consider the Meaning of Things; they consult not creed or clan.
Behold they clap the slave on the back and behold he becometh a man!
They terribly carpet the earth with dead, and before their cannon cool,
They walk unarmed by twos and threes to call the living to school.

* * * * *

Certainly also is Kitchener mad. But one sure thing I know—
If he who broke you be minded to teach you, to his Madrissa go!
Go, and carry your shoes in your hand and bow your head on your breast,
For he who did not slay you in sport he will not teach you in jest.

If, on one side of his political gospel, Mr. Kipling has brought out such poems as "The White Man's Burden" and many prose stories intended to show the duty of a dominant country towards weaker dependencies, he has also grasped the difficult problem presented by the need of bringing into closer political union the various branches of the English-speaking protectorates that are now called the self-governing colonies. The problem that has faced English statesmen ever since the abandonment of the idea of getting rid of protectorates as soon as possible and letting them become independent, has been how to build up a political scheme that would permit of the local independence of Canada, Africa, and the Australian colonies together with a union of representatives of those great English-speaking communities with the central government at home. Mr. Kipling has perceived that difficulty. English statesmen who have never been outside of the mother country cannot see it.

What can they know of England who only England know?

Mr. Kipling had the advantage of travelling and was therefore able to realize the difficulties that must meet all statesmen in forming any scheme of imperial federation. I think he grasps the difficulty and explains it best in a poem called "The Native Born," in which he speaks of the groups of English-speaking people who have sprung up in different parts of the world, and tries to make clear to the English people at home what is the sentiment of these "native born." The poem begins:

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We've drunk to the Queen—God bless her!—
  We've drunk to our mothers' land;
We've drunk to our English brother
  (But he does not understand);
We've drunk to the wide creation,
  And the Cross swings low to the morn,
Last toast, and of obligation,
  A health to the Native-born!

They change their skies above them,
  But not their hearts that roam!
We learned from our wistful mothers
  To call old England "home;"
We read of the English sky-lark,
  Of the spring in the English lanes,
But we screamed with the painted lories
  As we rode on the dusty plains!

They passed with their old-world legends—
  Their tales of wrong and dearth—
Our fathers held by purchase,
  But we by the right of birth;
Our heart's where they rocked our cradle,
  Our love where we spent our toil,
And our faith and our hope and our honor
  We pledge to our native soil!

* * * * *

It is such poems as this, showing the essential difficulty of any system of union between the mother country and the colonies that has yet been devised, which make it true, I think, that Kipling is by the grace of God Poet Laureate of Greater England, whatever Alfred Austin may be by the grace of Lord Salisbury.

The other poem that illustrates my point is "The Flowers." Here Mr. Kipling takes colony by colony, gives its essential characteristics, and the difficulty of union. The poem is suggested by a passage in the "Athenæum:" one of those patronizing remarks with regard to colonial literature, which, now that I have been away from England for so long, I can appreciate very much better than I did. In a review of certain poems the writer said: "To our

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private taste there is always something a little exotic and artificial in songs which under an English aspect are yet the product of other skies. The very fauna and flora are alien. Nor can we ever believe that the red robin sings as sweetly in April as the English thrush." This suggested to Kipling the poem, "The Flowers."

* * * * *

Buy my English posies!—
You that scorn the may
Won't you greet a friend from home
Half the world away?
Green against the draggled drift,
Faint and frail and first—
Buy my Northern blood-root
And I'll know where you were nursed!

Robin down the logging-road whistles, "Come to me,"
Spring has found the maple-grove, the sap is running free;
All the winds o' Canada call the ploughing-rain.
Take the flower and turn the hour, and kiss your love again!

* * * * *

Buy my English posies!
Ye that have your own
Buy them for a brother's sake,
Overseas, alone.
Weed ye trample underfoot
Floods his heart abrim—
Bird ye never heeded,
Oh, she calls his dead to him!

Far and far our homes are set round the Seven Seas.
Woe for us if we forget, we that hold by these!
Unto each his mother-beach, bloom and bird and land—
Masters of the Seven Seas, oh, love and understand!

Before turning to the two little poems with which I propose to illustrate my final point, the Kipling gospel of work and discipline, it occurs to me that I might read a couple of poems in which Mr. Kipling has brought out, I think, something of the meaning of the great struggle which is passing now in South Africa. In the poem in which he commemorated in some twelve lines the death of

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General Joubert, Mr. Kipling, I think was the voice that spoke for the English people. Whatever may be the general attitude that history will take with regard to the war in South Africa, one thing is certain, that Mr. Kipling has represented the feeling of the English people in his lines upon General Joubert. The very sincere admiration that breathes from all letters from the front for that great Boer general who fought so gallantly though so unsuccessfully,—every word in English newspapers, from the message sent by the Queen to Mrs. Joubert at the time of General Joubert's death, to the expressions of sympathy in letters of officers and soldiers,—all echo the respect for a gallant foe; and I for one cannot but hope that one of the things that will eventually bring closer together in some common form of government the races that are at present struggling in South Africa, will be the intense admiration felt by gallant foes for each other, in whatever army they may be fighting. Mr. Kipling's words on Joubert are brief but strong:

> With those that bred, with those that loosed, the strife
> He had no part whose hands were clean of gain;
> But, subtle, strong, and stubborn, gave his life
> To a lost cause and knew the gift was vain.
>
> Later shall rise a people sane and great,
> Forged in strong fires, by equal war made one,
> Telling old battles over without hate—
> Noblest his name shall pass from sire to son.
>
> He shall not meet the onsweep of our van
> In the doomed city when we close the score;
> Yet o'er his grave that holds a man
> Our deep-tongued guns shall answer his once more.

And if Mr. Kipling in that poem has expressed his opinion of Joubert, he has in another poem, written in his "Barrack-Room Ballad" style, given the key-note for the admiration felt by the soldiers of the British army for the general who is now leading them in South Africa. The little poem entitled "Bobs" was originally published in

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the Pall Mall Magazine, and at the request of General Roberts has never been reprinted. Roberts is a man who does not advertise, and very much disliked this poem written upon him. The poem was written just after Roberts, commonly known as "Bobs," retired from the Indian command, came home, and was made a peer.

There's a little red-faced man
Which is Bobs,
Rides the tallest 'orse 'e can—
Our Bobs.
If it bucks or kicks or rears,
'E can sit for twenty years,
With a smile round both 'is ears—
Can't yer, Bobs?

* * * *

If you stood 'im on 'is 'ead,
Father Bobs,
You could spill a quart of lead
Outer Bobs.
'E's been at it thirty years,
An' amassin' souveneers
In the way of slugs an' spears—
Ain't yer, Bobs?

What 'e does not know o' war,
Gen'ral Bobs,
You can arst the shop next door—
Can't they, Bobs?
Oh, 'e's little, but 'e's wise,
'E's a terror for 'is size,
An'—'e—does—not—advertise,
Do yer, Bobs?

* * * *

Then 'ere's to Bobs Bahadur—little Bobs,
Bobs, Bobs,
Pocket-Wellington an' "arder"—
Fightin' Bobs, Bobs, Bobs!
This aint no bloomin' ode,
But you've 'elped the soldier's load,
An' for benefits bestowed
Bless yer, Bobs!

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There are two brief poems which I wish to read as explaining the last stage of Kipling's development, the gospel of Kipling. It seems to me the two main things that he dwells upon are work and discipline. With regard to work, you will remember he gives a skilful analysis of how work should be done, and must be done, if it is to be any good,—for its own sake. In his novel, "The Light That Failed," I think he gives the best analysis of the modern theory of successful work that I know of. But in his verse he has dealt with the question of work in the celebrated three stanzas which I propose to read. It seems to me that in this poem, and in the last poem that I shall read (the dedication to the "Ballads and Barrack-Room Ballads") he gives us most fully his ideal of man. With that I will conclude the final point of my lecture. The "L'Envoi" to the "Seven Seas" deals mainly with the question of work:

When Earth's last picture is painted, and the tubes are twisted and dried,
When the oldest colors have faded, and the youngest critic has died,
We shall rest, and, faith, we shall need it—lie down for an æon or two,
Till the Master of All Good Workmen shall set us to work anew!

* * * * * * *

And only the Master shall praise us, and only the Master shall blame;
And no one shall work for money, and no one shall work for fame;
But each for the joy of the working, and each, in his separate star,
Shall draw the Thing as he sees It for the God of Things as They Are!

In that poem I think the gospel of work as one of the wings of the Kipling gospel is best expressed; but most fully of all, perhaps are his ideas as to what a man should do, how he should live, and what are the causes of chiefest praise to men, contained in the half dozen stanzas which he published as a dedication of his "Ballads" to Wolcott Balestier. Mr. Kipling married the sister Wolcott Balestier, and was very fond of that brilliant young American whose life was so early cut short. This poem in spite of certain extravagancies, contains lines which I think serve to bring out what I have called the Kipling gospel.

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Beyond the path of the outmost sun, through utter darkness hurled,
Further than ever comet flared or vagrant star-dust swirled,
Sit such as fought and sailed and ruled and loved and made our world.

* * * * * * *

They take their mirth in the joy of the earth—they dare not grieve for her pain—
For they know of toil and the end of toil—they know God's Law is plain;
So they whistle the Devil to make them sport who know that sin is vain.

* * * * * * *

To these who are cleansed of base Desire, Sorrow and Lust and Shame—
Gods, for they knew the heart of Man—men, for they stooped to Fame—
Borne on the breath that men call Death, my brother's spirit came.

* * * * * * *

Beyond the loom of the last lone star through open darkness hurled,
Further than rebel comet dared or hiving star-swarm swirled,
Sits he with such as praise our God for that they served his world.

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PHI BETA KAPPA ADDRESS.*

By Robert J. Burdette.

I would leave just one thought with you this afternoon, and that is faith. When the great teacher gathered the people around him, he said "All things are possible to him that believes." Conversely speaking, absolutely nothing in this world is possible to any man or woman, no matter how well equipped, unless he believes. There is no room in this world for doubt; in fact there is no such thing as honest doubt.

All that has been done in this world has been done by men who saw in the dark, by men who believed as the old French minister, "If it is impossible, it shall be done. If it is difficult, it is done already." The world has always been moved by people who, like Columbus, could not see, but who believed.

You say "A cat may look at a king;" yes, but the cat never sees the king. It sees, if it sees anything, only the man. Men look with their eyes, but see with their souls. One man saw the great possibilities of a transatlantic steamship line, but people laughed at him. One learned man wrote a pamphlet against the scheme, proving conclusively that it was absolutely impossible for a steamship ever to cross the ocean. The first voyage the steamer made across the sea, she brought five hundred of these pamphlets

*Delivered at the annual meeting of the society, in the Harmon Gymnasium, May 15, 1900.

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as part of her cargo, and people read them and believed every word they contained.

It is necessary to have faith. You must believe in something, and that something is to carry your life on to accomplishment. This is not the most wonderful age the world has ever seen; we are only following in the footsteps of other workers. After Columbus had set an egg on end, the whole world could do it; after the first message had been ticked off on the telegraph wires, the rest was easy. It was the men who could see in the dark, who had faith, who moved the world. It was a boy who laid his ear down to the steel rail and heard the vibrations. He saw the possibilities of a solid wire instead of a hollow tube.

Now, when one goes out into the world to work he does not always do what he planned to do. It is very pleasant to have congenial work, but sometimes God puts a higher estimate upon a man than the man himself does, and says, "Here is something I want you to do that is disagreeable." Now, you can take hold of that disagreeable work, that you don't want to do, and do it splendidly. In fact the best things that have ever been done have been things that men have been compelled to do. Napoleon Bonaparte did not dream of military renown at school. His best biographer tells us that such thoughts were farthest from his mind. He had ambitions to be a journalist; and if he had been a private soldier he would have been shot for desertion, he shirked his duties so. But when he was called upon to take up this disagreeable duty and free France, he did it magnificently. When U. S. Grant received his cadetship in West Point he told his father he believed he wouldn't go. His father said he believed he would,—and Grant went. But the glory of war never had any charm for him. I never saw him with a sword-belt around his waist. He generally had as much use for a sword as a preacher has for a pistol. Grant was a hard man to walk with. He never did have the alert, well-trained step of the soldier; and it was as hard to keep step with him as with a woman.

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Every person begins his life with an ideal, and everyone should plan his life as if he were going to live for seventy years. I believe that the angels look upon a man who dies before he is seventy years old with suspicion. They think he must have done something wrong in his life or he would not have died so young. The way to success is to do one thing and to do it well, and to believe that you can do it better than anyone else in the world. You may call it conceit, or egotism, or what you please, but it is the source of power which enables men to do things.

The boys are the ones who lead the world. The boy knows more than his father. If Robert Morse had not known more than his father we would never have had the telegraph; if Fulton had not known more than his father we would have had no steamboats; if Columbus had not known more than his father, we would still be sitting in the swamps waiting for someone to discover us.

A graduate comes out of a great institution like this with plans for great things, but there is more opportunity for doing the commonplace things—the things which we trample under foot. Age after age men looked at the lightning as it zig-zaged across the sky, but they did not know what it was. By and by a man came along and looked at it for a while and concluded to investigate it. People said it would kill him, but he said he was going to try it anyway; and it didn't kill him. He said it was electricity. Another man came along and said, "No, it is a lead pencil," and he wrote a telegram. Another said it was a candle-wick, and he turned night into day; another said it was a speaking tube; another said it was a mule and he hitched it up to a trolley car. I don't know what else it is, but these men all looked into the dark and saw something which only their wonderful faith could reveal to them.

It is not possible for every man to be equipped with all the university can give him; but he has his body, his soul, and that wonderful thing called faith, and what he thinks

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he can do, I believe he really can. The only thing is not to lose this confidence.

Sometimes it is better to be defeated than to win a victory. Bunker Hill commemorates a defeat. Thermopylæ was a defeat. Sometimes a team comes back from a distant university carrying more glory in the defeat sustained than in the victory won. It is good for a man to meet with some reverses.

I think one of the grandest spectacles of these closing days was when Andrée stood before the Geographical Society and detailed to them his plans. They were all explorers of considerable fame. Some one asked him what he would do if something happened to his balloon. He turned around and pointed to the different explorers who were sitting in the room and said, "I will come back just as you did when something happened to your ship." God never deserted a man who had such supreme confidence in himself. What difference does it make whether this carcass comes back or not? His sublime confidence will come back and be a power among men. It is the men who believe that this world is going on from better to better, and who have no patience with the idea that the world is drifting backward that help to move the world onward. Every year the world is nearing its goal. If you go back to the book, you will find that it was the evening and the morning that was the first day. Always from the night to the dawn, always from the darkness to the light.

Every group of men who have faith in themselves, as they have faith in God, are coming to the light where there will be no darkness. The good, the better, the last and the best. Hoping, believing in men, serving God with heartiness, doing that which the heart and the soul know is the right thing to do.

Now, it does not make any difference what the so-called advantages are, I believe we are born free and equal. I do not care what a man's ancestry was. I don't care who was a man's father. That has nothing to do with it. Every

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man stands on a platform by himself. He has body, brain, and soul; and underneath it all is the blessing, faith from God, and how can we keep our hearts from singing when we know that?

At the beginning of things the first command issued into chaos, into darkness, and into night was, "Let there be Light." And we may turn over the pages of the old book until we come to the last page, down to the last word almost, and we read, "There shall be no night."

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THE SUMMER SESSION OF 1900.

By THOMAS R. BACON.

For some years the University has offered summer courses during the vacation period. They were first offered by the departments of chemistry and physics. Last year some other departments gave courses, and this year the work has been so far extended as to call for special notice. Thirty-seven courses were offered by eleven departments; thirty-five courses were actually given; there was no call for the courses in advanced Hebrew and advanced Arabic. All these courses were of the grade of college work, except one course in Greek, two courses in Latin, one course in physics, and one in chemistry. The demand for these preparatory courses seemed to be imperative at this time, but the policy of giving courses which ought to be given by the high schools is certainly open to criticism and discussion. The departments concerned in the summer session were philosophy, pedagogy, history and political science, Semitic, Greek, Latin, English, mathematics, physics, chemistry, and botany.

The number of persons engaged in instruction was 22. The total number of students enrolled was 433. There were in addition a large number of persons who had the advantage of instruction as "visitors," and who neither enrolled nor paid fees. This class of persons should be provided for hereafter.

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The enrollment according to departments was as follows: Philosophy, 27; pedagogy, 264; history, 230; Semitic, 4; Greek, 11; Latin, 62; English, 148; mathematics, 35; physics, 103; chemistry, 99; botany, 82. Of these 167 took preparatory work, distributed as follows: Greek, 11; Latin, 52; physics, 52; chemistry, 52. Of the total number enrolled (433) 254 tried the examinations; 229 were successful in passing one or more; 179 did not try.

Of the instructors, five were drawn from other institutions; the remainder were from the University of California. I hope that another year it will be possible to secure more teachers from outside, as it is certainly stimulating to our students to thus get in touch with wider spheres of thought and method than it is possible for any one institution to fill.

Of the students registered for the summer session, 52 per cent. were women, a much larger percentage than is shown in the regular sessions of the University. There were 90 college graduates, 35 being graduates of this University. There were 147 undergraduate students, 120 belonging to this University, 22 to Leland Stanford Junior University, and the other three to other institutions. 37 were "apparently preparatory students." The greater part of those who took preparatory work seem to have been students actually in college, who wished to make up deficiencies.

239 of these students were teachers. Of these, 70 were graduates of some college. This is significant, for it shows the value of the policy which the University has long pursued, of encouraging the school teachers of the state to come to the University, if only for a little time, to improve their scholarship. We find that they are anxious to come to one or the other of our universities, and the effect of the encouragement is visible everywhere in the state.

A matter of great local and institutional interest is the geographical distribution of the students. The Recorder's office shows that about 18 per cent. of our students come

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from the county of San Francisco; and the incredible percentage from Alameda county is 40. These figures are not only incredible; they are deceptive. How far they are deceptive is easily shown. Only 28 per cent. of the students who have entered the University this year profess to come from Alameda county. This includes all the persons whose families have moved to Berkeley in order to take care of their young people in college, and all the young men who have reached the age of twenty-one, and who are anxious to vote in the national election. As they get more settled, they will declare that their residence is in Berkeley, and thus increase the apparent disproportion between the representatives of Alameda and the other counties.

The records of the summer session show that the percentage from the rural counties is far greater than in the ordinary sessions. San Francisco county, which is ordinarily credited with 18 per cent., had only 15 per cent. Alameda county, which has a record of 40 per cent., sent only 34 per cent. Sonoma county, which has never sent more than 3 per cent. of our students, sent 7 per cent. to the summer session. The geographical distribution of the students of the summer session is not fully worked out, but enough has been done to show that a far larger proportion of the students came from outside the counties of San Francisco and Alameda than come to the ordinary sessions. The number of students attending the summer session who come from other states is too small to call for notice. It is smaller than at the regular semesters.

The University received, in tuition and laboratory fees for the summer session, $4,330.00. It expended for salaries $2,700.00. The surplus of $1,615.00 went to the Library. So, it will be seen, the summer session not only paid its own way, but was able to give substantial financial help to the whole University.

This year the emphasis was laid mainly upon pedagogy and history. It is probable that it will always be necessary

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to lay a good deal of emphasis upon the courses in the science of education. From my own experience I should judge that the teachers in the grammar and high schools need to add to their knowledge of the subjects which they are called on to teach, and are pretty good teachers of what they know. But so long as they desire instruction in methods, the department of pedagogy will have to give them what they want. The special emphasis which was laid upon the subject of history need not be repeated at once. The department of history and political science did the best that it could this year. Although it was crippled by the exportation of its two most important members to the Philippine Islands, it was able, with the help of Professor Clyde A. Duniway, of Leland Stanford Junior University, to present a fair list of courses, and to give the courses announced in a satisfactory manner. It is desirable that such emphasis shall be laid, from year to year, upon other lines of study, but I do not see how the department of pedagogy is going to escape from the burden for several years to come; until such time as teachers learn that it is quite as important to know the subject matter of teaching as the methods by which to teach.

There are certain inferences to be drawn from our summer experience, which are of value to those who are interested in the University of California and in education throughout the state. I put forth these inferences as purely personal. They are my own and commit no one but myself.

I. There is need of a summer session. The fact that a good many more than 433 persons came up for instruction in the University shows that the University could not fulfill its function unless it provided for the instruction of these persons. The question whether the state should make provision for college education is still an open one, but the State of California has committed itself in this matter. It has entered upon the policy of giving the highest education that it can afford "without money and

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without price." The fact that 239 teachers took instruction in the summer session is evidence that the summer session is needed. The education of teachers for the primary and secondary schools is, perhaps, the most important use of the University, and it can be fulfilled in no better way than by affording opportunities of instruction during the vacation of the schools.

II. A second inference has regard to the suggestion of a "continuous session," after the manner of the University of Chicago. This method involves four terms, of three months each, the purpose being to afford opportunity to teachers to get a term of university work, during the summer vacation, and to allow students who are anxious to do so to graduate after a course that is less than four years. The latter purpose is so bad as not to call for serious discussion. The other purpose is so good that it must be considered. On the whole, the experience of our summer session is not favorable to the idea of a "continuous session." Many of the teachers who came had to come late, because their vacations began later than June 25th, and many of them had to leave before the session closed, because their terms began before August 3rd. The term of the summer session was fixed with special reference to the school vacations, but it was impossible to arrange it so that it would not conflict with the terms of some of the schools. In the East climatic conditions make the summer vacations of the schools nearly synchronous. But the climatic conditions of California almost compel the schools to have their summer vacations at different times. It is possible that the University might compel the schools to come to an agreement in this matter, but it would be a very doubtful kind of experiment, and one upon which I should not care to enter. There is already enough resentment in the schools of the domination of the University.

III. The financial outcome of the summer session seems to me worthy of consideration. A uniform fee of $10.00 was exacted from all students, beside laboratory fees for

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material and breakage in the scientific departments. The total amount thus received, less the salaries, was $1615.00, which has been devoted, by vote of the Board of Regents, to the very great needs of the Library. The fee was so small that there were few, who could afford to come to college at all, who could not afford to pay it. In the few cases of those who could not afford to pay the fee that came under my notice, private benevolence was ready to step in. As I have heretofore suggested, many persons availed themselves of the advantages of the summer session as "visitors," without paying any fees whatever.

On the whole it may be said that the summer session of 1900 was thoroughly successful. It supplied a real want. At the same time it does not seem to show the possibility of expanding into a regular term of the University under present conditions. In regard to the propriety of having the University do preparatory work, I have a fixed opinion, which may be inferred from what I have said. It may be necessary for the present, but it ought not to be adopted as a permanent policy.

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FARMERS' INSTITUTES DURING 1899-1900.

Farmers' Institute work during the fiscal year ending June 30th was prosecuted with very satisfactory results in nearly all parts of the state. It was found necessary to reduce the number, because the funds available for traveling expenses were less, but still by close economy in such expenditures it was possible to hold more than seventy institutes. They were for the most part two-day institutes, but in answer to pressing request one was continued through three days at Santa Barbara and another through four days at Pasadena. The attendance continues large as a rule. It is seldom that less than two hundred attend an institute and an attendance of four hundred is often reached. It is a fair estimate that a total of twenty thousand has been gathered during the year by this branch of University Extension. The sentiment of the people in favor of the increase of the work is very pronounced and resolutions are often adopted calling upon the legislature adequately to provide for Farmers' Institutes by special appropriation as is done in other states. Some institutes are appointing committees to urge the importance of the matter upon legislative candidates and to pursue the subject farther with those who succeed at the coming election. It is likely that the legislators, especially those chosen from the southern part of the state, where institute interest is keenest, will go to Sacramento well informed of the need of liberal provision for an effort which is generally conceded to be accomplishing so much.

The report of the Agricultural College and Experiment Station of the University, which is now being printed by the State Printer, will contain a review of the Farmers' Institute work and its relations to other lines of agricultural teaching and research.

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IN MEMORIAM.

HON. ALBERT MILLER.

At a meeting of the Regents held May 15, 1900 the following memorial and resolutions upon the death of Albert Miller, late Regent of the University of California, submitted by Regent Rodgers, on behalf of the Committee, were adopted:

The Committee, to whom was referred the preparation of suitable memorial and resolution concerning our deceased friend, Albert Miller, a Regent of the University of California, respectfully submit the following:

Albert Miller was born February 12, 1828, in the town of Piena, Hanover, Germany. His ancestors long lived in the town of Müden the north central part of Prusia, and were, from father to son, engaged in the calling of millers, hence the name. During the Thirty Years' War the family was gradually dispossessed of its properties and toward the close of the war the grandfather of the subject of this sketch took up his residence in Piena about the year 1780.

Albert Miller was educated at the public gymnasia of Brunswick and received about the same intellectual training as that received by a boy in an American High School. After the completion of such an education, he embarked in commercial pursuits, and especially acquired knowledge of the manufacture and sale of fine linens. Thus equipped he arrived in New York on the first Tuesday in November, 1848, where he remained for about a year. He then removed to New Orleans and resided there during the plague of yellow fever in 1849. Subsequently, after a brief residence in Richmond, Virginia, he came to California in the spring of 1851. For a short time he was employed upon the *Bulletin* newspaper and then embarked in the dry-goods business in the service of Hussy, Bond & Hale. In 1856 he became a member of the firm of Jansen, Bond & Company. In this firm he continued with great success in the wholesale dry-goods business until his retirement from active business in 1865, when he made an extensive tour in Europe with his family.

On October 17, 1854, at San Francisco, he married Miss Mary Ann Kendall, the grandniece of Sir Joseph Paxton, architect of the Crystal Palace of London. Of this marriage there are living seven children.

Mr. Miller was at all times deeply interested in educational affairs. He was president for several terms of the Mercantile Library of San

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Francisco, and was an officer of the Young Men's Christian Association during the first years of its organization in California.

He was deeply concerned in the reform movement in California in 1856, and was an active member of the Sanitary Commission during the Civil War, and a most liberal monthly subscriber to the funds of this beneficent and patriotic organization.

In 1862 he became one of the incorporators of the San Francisco Savings Union and was the last survivor of the original directors of that institution. He resigned its presidency about two years and a half half ago, but continued to be a director of the great bank until his death.

In 1887 he was appointed a Regent of the University of California by Governor Washington Bartlett to fill the unexpired term of J. W. Winans, Esq. At its expiration he was appointed by Governor R. W. Waterman for the full term of sixteen years.

Though in no sense a public man, Mr. Miller was well informed on public affairs. He was a subscriber to the leading journals of the capitals of the great nations of Europe and kept fully in touch with continental politics. His favorite study was political economy, particularly in respect to public revenues and taxation, and in this connection he had accumulated a large amount of data for a work upon this subject which, unfortunately, he never published.

While unostentatiously liberal in his charities and giving freely of his means to benevolent purposes, he was a conservative, prudent, and persistent man of business.

In the early years of California's development he was a very active member of the Republican Party, but of late years took little part in its fortunes. His chief interest, aside from his family to which he was singularly devoted, was centered in the University of California. He was a member of its Finance Committee and devoted much time and attention to its interests, and whatever success has attended the financial affairs of the University, much of it can be truthfully said to be due to the unfailing care and prudence with which Mr. Miller discharged his many and often perplexing duties in connection with them.

He died full of years and honor on April 16, 1900.

This record of a useful and honorable life is of necessity but an epitome of an active career; and it is hereby

Resolved, that the death of Albert Miller has removed from the Regency of the University of California one of its most valued and respected members, whose devotion to its interests has never been excelled and whose memory will forever remain among those who survive him, as an example and inspiration.

Resolved, that this memorial be spread upon the records of the Board and a copy thereof be transmitted by the Secretary of the Board of Regents of the University of California to his family.

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HON. A. S. HALLIDIE.

At a meeting of the Regents held July 24, 1900 the following memorial and resolutions upon the death of A. S. Hallidie, late Regent of the University of California, submitted by Regent Slack, on behalf of the Committee, were adopted:

SAN FRANCISCO, July 24, 1900.

To the Honorable Board of Regents of the University of California,

GENTLEMEN:—Your Committee appointed to prepare resolutions in memory of the late Regent Hallidie, submit to your Honorable Board the following:

Andrew Smith Hallidie died in San Francisco on the 24th day of last April. It is appropriate to record in the proceedings of this Board a brief sketch of his well-spent life and of his eminent services to the University and to the public. Mr. Hallidie was of Scotch descent. He was born in London, England, March 16, 1836. He had but little schooling, yet he made himself an accomplished mechanical engineer, and even a learned man. He came to California when he was but seventeen years of age, and first engaged in mining. Being unsuccessful in mining, he turned his attention to the business of engineering, for which he had an inherited inclination. In 1855, when but nineteen years of age, he designed and built a wire suspension flume across the Middle Fork of the American River, for the purpose of conducting water to mines. He became interested in making wire rope, and in 1857 established a manufactory for that purpose in San Francisco. From 1858 to 1868 he designed and built a large number of bridges, principally wire suspension bridges, across several rivers in this State and in British Columbia. He made several inventions for the transmission of power, and for the transportation of freight over canyons and rough surfaces, by means of endless wire ropes. His most important invention was that of the cable railway, which was perfected and first put in practical use in San Francisco in 1873. This invention brought him fame and fortune.

As President of the Mechanics' Institute, Mr. Hallidie attended the first meeting of this Board, as a Regent of the University, on June 9, 1868. Continuously from that time to the date of his death he was a member of this Board, either as President of the Institute, or by virtue of appointment from the Governor of the State. He was a member of the Auditing Committee of the Board from July 15, 1868, until the Auditing Committee and the Finance Committee were consolidated in June, 1874, when he became Chairman of the Finance

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Committee, a position which he held until the time of his death. Much of the successful handling of the funds of the University is due to his careful attention to details and to his wise and conservative counsel. During the period between the election and the installation of President Wheeler, Mr. Hallidie acted as President of the University.

Although a conservative man, Mr. Hallidie was always ready to accept new ideas in the educational affairs of the University. He fully understood and appreciated the good in education, and wanted nothing but the best. While interested in all branches of learning, he was particularly interested in manual training, and gave much thought and attention to the organization of the Wilmerding School and to the conduct of the California School of Mechanical Arts, of which latter institution he was a valued trustee. At the request of this Board, he visited the various trades' schools of the country, and selected the principal of the Wilmerding School.

Mr. Hallidie was not a politician, but he always took an active part in municipal affairs, especially in reform movements. He was a member of two boards of freeholders, formed for the purpose of framing a charter for the government of San Francisco.

Every position in his public life he has filled with honor, fidelity, and integrity. In his private life he was devoted to his family and true to his friends.

Be it therefore resolved, that in the death of Andrew Smith Hallidie this Board has lost a wise counselor and the University a faithful servant.

Be it further resolved, that this memorial and these resolutions be spread upon the minutes of this Board.

Respectfully submitted,

I. W. HELLMAN,
CHESTER ROWELL,
CHARLES W. SLACK.
Committee.

Adopted, and the Secretary was directed to send a copy of the above resolutions to the widow of the late Regent Hallidie.

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OFFICIAL ACTION.

At a meeting of the Regents held June 12, 1900, on recommendation of the President, the name of the Department of Pedagogy was changed to Department of Education.

At a meeting of the Regents held June 12, 1900, on recommendation of the President, in accordance with the report of the Board of Administrators of the LeConte Fellowship Fund, Miss Alice Robertson and Knight Dunlap were appointed LeConte Fellows for 1900–1901.

Early in August the President received the following letter and a life-sized portrait of Professor Howison, painted by Mrs. Mary Curtis Richardson:

President Benjamin Ide Wheeler,
University of California, Berkeley, California,

DEAR SIR:—We beg acceptance at the hands of the Board of Regents of the portrait of Professor George H. Howison which accompanies this letter. It is a gift from the young men and women who have set in Professor Howison's classes from his coming to the University down to the Class of 1899.

You will convey to the Board, as the sense of the donors, that the portrait should be hung in the Library, as the safest and most nearly fire-proof of the buildings; but once the frail wooden structures are replaced by the enduring stone and brick of the Greater University, they trust it may find a permanent place on the walls of the Philosophical Building.

We beg to subscribe ourselves on behalf of the donors,

Very sincerely yours,
J. K. MOFFITT,
ALEX. G. EELLS.

San Francisco, August 8, 1900.

The President reported the gift to the Regents at the meeting of September 12th, and on his recommendation a vote of thanks was extended to the donors.

At a meeting of the Regents, October 9, 1900, President Wheeler reported "I have a great deal of pleasure in

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presenting the following communication from Mr. R. C. Daniels, formerly a holder of one of our scholarships:

October 3, 1900.

DEAR SIR:—While a student in the University of California, in the class of '99, I was the recipient of a State of California Scholarship for twelve months, from August 1897 to September 1898, both inclusive.

The money thus received by me, amounting to $150.00, was of great assistance at the time, but I always regarded it as a loan from the University, not a gift, and being now in a position to repay this loan, I desire to do so.

If agreeable to yourself and the Board of Regents, I would venture to suggest that this sum of $150.00 might be offered as a special one-year State of California Scholarship, to some worthy student. This, of course, is merely a suggestion, and I desire the money to be entirely at the disposal of the proper authority.

If you will advise me at your convenience of the acceptability of my offer, and of the form in which it may be most conveniently paid over to the proper authority, I shall esteem it a favor. I am

Very truly yours,
RALPH C. DANIELS.

On motion of President Wheeler the money was accepted and the Ralph C. Daniels Scholarship, to be given as other scholarships are awarded, was established. President Wheeler thus conveyed to Mr. Daniels the action of the Regents:

October 10, 1900.

MY DEAR MR. DANIELS:—Your very proper and noble offer as made in your letter of the third instant has been most cordially accepted by the Board of Regents. The Board has voted to constitute for the coming year a special scholarship to be called the Ralph C. Daniels Scholarship. I have been requested, furthermore, by the Board to express to you its thanks and its appreciation of the high motives which actuated you in the gift. Your feeling that the money advanced to you in the form of a scholarship was really a loan and not a gift is entirely the correct one, and I trust that your action will form a precedent for others. Very sincerely yours,

BENJAMIN IDE WHEELER.

At a meeting of the Graduate Council held September 28, 1900, the regulation requiring of all candidates for the degree of Doctor of Philosophy "a knowledge of Latin equal to that admitting to the College of Letters of this University" was abrogated.

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At a meeting of the Academic Council held March 9th, the following report was adopted:

To the Academic Council:

The committee appointed by the Council, on September 8, 1899, to find some more reasonable interpretation of the phrase "most distinguished graduate of each year," for the purpose of suggesting a just and practicable method of awarding the medal, begs leave to state the following:

In 1871 the following communication was made to the Board of Regents, and accepted by them:

"We, the undersigned, desirous of furnishing a stimulus for the development of the best talent in the University, hereby agree to subscribe fifty dollars ($50.00) each to a fund to be invested, and the proceeds annually applied to the purchase of a gold medal, of suitable design, to be awarded to the most distinguished graduate of each year.

"April, 1871." "(39 signatures.)

On March 13, 1873, the fund amounted to $2,383.68; on July 1, 1899, it amounted to $4,014.34. The annual income from this fund is at present about $240.00; the cost of the medal has not exceeded the sum of $125.00 each year, so that the Medal Fund at present increases at the rate of about $115.00 per annum.

In a communication to the Regents, dated June 13, 1892, (Secretary's Report to the Regents, 1893, p. 75, the University Medal Fund,) President Kellogg reported "that the Academic Council and the Faculties are of the opinion that the bestowal of the medal is not the most desirable means of accomplishing this purpose," *viz.*, "to furnish a stimulus for the development of the best talent in the University."

It is the opinion of the committee that during the years which have elapsed since 1892 the infelicitous conditions of awarding the medal have continued without interruption.

I.

1. The committee assumes that a *distinguished* student of any college of the University is one who approaches as closely as possible to the ideals of scholarship suggested by the courses of study of that college.

2. The committee recommends the following method of determining the *distinguished* students of senior standing for the year:

In colleges with a prescribed course they shall be nominated by the Dean of each college, with and by the advice of the members of the Faculty of such college.

In colleges with group electives they shall be nominated in writing to the Dean of each college by the head of the department in charge of the group elective work of the candidate.

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February first of each year, is suggested as the latest date for such nominations.

3. Nominees with a serious delinquency of scholarship or conduct shall not be considered by the Deans as *distinguished* students.

4. If the Deans of the different colleges are able to determine from the list of *distinguished* students the *most distinguished* graduate of the year, they shall recommend such student to the Council as worthy to receive the University medal.

5. If the evidence at the disposal of the Deans of the different colleges does not enable them to designate the *most distinguished* graduate, then such candidates as shall have been agreed upon by the Deans shall be invited to write a competitive dissertation on such subject as the candidate may select from a list of subjects offered by the Deans with the approval of the President.

6. The conditions of such competition shall be arranged by the Deans and approved by the Council.

7. In this competition the final recommendation of the *most distinguished* graduate of the year shall be made by the Deans on the general grounds of originality of treatment, comprehensive view of the subject, and purity of diction, and such other specific requirements as may be suggested by the nature of the theses offered.

II.

1. The list of the *distinguished* students of senior standing shall be reported to the Academic Council for final approval on or before the first meeting of the month of March of every year.

2. It is recommended that the Editorial Committee have such list of the distinguished graduates of the year printed and published in the REGISTER of the University.

Respectfully submitted, for the Committee:

J. H. SENGER, *Chairman.*

At a meeting of the Academic Council held May 14, 1900, the following resolutions were adopted:

(1) Any undergraduate who, at the end of any half-year, fails to pass in at least five units of new work, will be dropped from the roll; provided, that any student who for reasons of exceptional urgency is permitted to register for less than five units of new work, will be required to pass in all of the units so registered, or will be dropped from the roll.

(2) A regular or limited student dropped from the roll on account of deficiencies will have an opportunity to reënter after an interval of one half-year; provided that during the interval he makes good by reëxaminations his deficiency in the five units required in 1, as above;

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and provided, further, as a condition of further university work, he first remove all matriculation deficiencies.

(3) The regulation, requiring of participants in intercollegiate athletic contests a special standard of scholarship, has been abrogated.

The Schools Committee of the Academic Council has been charged with the question of the revision of the University entrance requirements. The committee has addressed a circular to the heads of the departments at Berkeley, asking for suggestions. Such suggestions, says the circular, "may refer to addition or withdrawal of subjects; introduction of more advanced stages of subjects; and more or less flexible combinations of them in groups." It is not expected that the revision of the requirements can be effected during the current academic year.

New regulations of the Academic Faculties:

The regulation heretofore in force, which required students to pursue French, German, Spanish, or Italian at least two years in order to obtain credit, has been abrogated. Any of these languages may be taken for a single year, provided that the modern language requirement of the curriculum be satisfied.

In scholarship grading the Third Grade will hereafter denote a Pass without qualifications. Grades Four and Five will indicate deficiency (condition and failure respectively), as heretofore.

SCIENTIFIC SOCIETIES.

SCIENCE ASSOCIATION.

In accordance with the policy adopted by the Council of the Science Association, hereafter to publish twice a year an official account of the proceedings of the Association, containing a list and short abstracts of the papers read before the various sections, the Secretary has prepared the following report for the second term of the academic year 1899–1900:

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General Meetings.—1. March 21.—Mr. A. W. Whitney. Evolution and the Theory of Probability. An account of the mathematical theory of probability and its application to the problems of variation and heredity.

2. April 10.—Prof. A. C. Lawson. The Wyoming Geological Expedition. An account of a joint expedition of sixty-six geologists from all parts of the United States to the fossil fields of Wyoming. The expedition was very successful, both on account of the specimens obtained and of the knowledge gained of the physical features and the geology of the country.

3. May 2.—Dr. E. J. Wilczynski. Poetry and Mathematics. Published in the UNIVERSITY CHRONICLE, Vol. III, No. 3.

The result of the election of officers for the ensuing year was announced as follows: President, Prof. J. C. Merriam; Secretary-Treasurer, Dr. E. J. Wilczynski.

1.—*Mathematics, Physics, and Astronomy Section.*—Chairman, Prof. G. C. Edwards; vice-chairman, Mr. E. R. Drew; secretary, Dr. E. J. Wilczynski.

February 14.—Dr. W. P. Boynton. The Kinetic Theory of Gases and Liquids. Dr. Boynton discussed critically the fundamental principles of the theory, reviewing both the old and the recent literature of the subject. It seems especially important to emphasize the relation between the kinetic theory of gases, and the more recent kinetic theory of liquids, on the one hand, and the theory of solutions, osmotic pressure, etc., on the other.

April 5.—Dr. E. J. Wilczynski. Lie's Group Theory and Hydrodynamics. An account of the speaker's investigations resting upon the fact that the equations of a one-parameter continuous group can be interpreted as the equations of a steady fluid motion. This paper has since been published in the Transactions of the American Mathematical Society, July, 1900.

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2.—*Chemistry Section.*—Chairman, Prof. W. B. Rising; secretary, W. C. Blasdale.

January 24.—Dr. J. C. Meyers. Some Derivatives of Methyl-paraconic Acid. An account of some original work by the author on this subject.

February 7.—W. C. Blasdale. The Color of Organic Compounds as Related to Constitution. A review of the various attempts to connect chemical constitution with color of phenomena.

February 28.—H. C. Bradley. The Color of Salts in Solution. An accout of the theory of electrolitic dissociation as applied to the explanation of the color of solutions of salts.

March 21.—W. H. Weslar. The Kinetic Theory of Gases. A discussion of the various theories relating to this subject.

April 18.—L. Eloesser. The Preparation and Uses of Phenacetin. An account of the commercial preparation and uses of this drug.

3.—*Geology and Mineralogy Section.*—Chairman, Dr. W. S. Tangier Smith; secretary, F. C. Calkins.

January 24.—Prof. E. W. Hilgard. The Geology of the Mississippi Embayment. A general review based mainly on Prof. Hilgard's own observations. Prof. Hilgard's writings on the geology of the region are mostly contained in the reports of the State Geological Survey of Alabama.

February 27.—F. C. Calkins. Notes on the Geology of Eastern Oregon. A brief geological sketch of the route travelled by the John Day Expedition under Dr. Merriam in the summer of 1899.

March 27.—Dr. Harold W. Fairbanks. The Geology of Vancouver Island. A general outline of the geology, based largely on the author's own observations. Especial attention was paid to the fiords, evidences of glacial action, and late changes of level. The lecture was illustrated by lantern slides.

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April 24.—Prof. A. C. Lawson. The Geology of the Caucasus and the Crimea. A general description of the geological structure and history of the region, which was visited by Prof. Lawson in 1897.

4.—*Botany Section*, conducted as a Botanical Seminary. Chairman, Prof. W. A. Setchell; secretary, Dr. W. J. V. Osterhout.

January 24.—W. C. Blasdale. Dantec's Bio-Chemical Theory of Heredity. The theory seems too vague and crude to be considered serviceable.

February 7.—W. C. Blasdale. Suggestions for a Chemical Theory of Heredity. A discussion of Dantec's theory with an attempt to show to what extent chemical considerations may assist in explaining the phenomena of heredity.

March 28.—Dr. Jacques Loeb, Professor of Physiology in the University of Chicago. Chemical Fertilization. A statement of the most fundamental problems of experimental morphology and the manner of attacking them, together with a detailed account of Prof. Loeb's remarkable discovery that the eggs of Sea Urchins may be made to develop normally, without fertilization, when magnesium chloride is added to the sea-water in definite proportions. An account of this discovery was published in the American Journal of Physiology, Vol. III, page 434.

February 28, March 24, April 11.—Dr. W. J. V. Osterhout. An Epigenetic Theory of Heredity Based on Chemical Considerations. A theory based on simple assumptions, capable of being tested by experiment and adhering closely to the facts is much needed. This theory is an attempt to fulfill these conditions and to explain numerous phenomena hitherto considered contradictory. Its central proposition is that the form of any organ or organism is determined by its chemical composition; this, in turn, depends on a progressive series of chemical changes whose nature is determined partly by the chemical

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composition of the egg, partly by the action of external agencies. Each step in the series prepares for and determines the next—subject, however, to the modifying influence of the environment—thus insuring the orderly progress of development. The differentiation of the organism into unlike parts is initiated by the formation of chemically unlike parts or regions in the egg and further developed and controlled by the environment which affects the various portions of the developing organism differently. Resemblance between parents and offspring depends upon similarity in chemical compositions at the moment when development begins and, further, upon similar external conditions during development. Variation is due to dissimilarity in either of these respects or in both of them. Variations due to the environment are inheritable only when they extend to the germ cell from which the new generation springs; this is possible in so far as they are chemical in nature; their effect may be cumulative during several generations and so result in an acquired character of considerable permanence.

May 2.—Miss Minnie Reed and Miss M. A. King. The Rôle of Functional Stimuli in Development. Many characters which are regarded as directly transmitted by the germ plasm or some local portion of it are due to stimuli or pressure from other parts of the organism. They cannot therefore be predetermined in a Weismannian sense. The number of such characters is probably very great. Their existence is an argument in favor of an epigenetic view of development.

5.—*Zoölogy Section.*—Chairman, Prof. H. P. Johnson; secretary, Miss Edna Congdon.

May 20.—Dr. Bancroft. Variation and Fusion in the Botryllidæ. The compound Ascidian Botryllus is a very variable genus and many species have been described from the same localities. The question of the validity of these species was tested by raising several lots of colonies from

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the same parent. It was found that the variations within a single family were so great that they included three or four described species. Every one of the characters hitherto used for distinguishing the described species was found to vary greatly within the same family, thus rendering it very probable that all the species of Botryllus described from Europe and Eastern America belong to a single species. Ordinarily adjacent colonies of Botryllus compete very strongly with each other for a substratum to grow on. But colonies derived from pieces of the same colony, some brother and sister colonies, and some colonies of the related genus Botrylloides, in which the variation is much less, would not compete with each other when brought into contact but fused completely, forming a common test, common vascular system, and systems containing zoöids from both colonies. It is thus seen that whether there is to be competition or fusion depends upon the degree of similarity between the two colonies. The question of the individuality of the colony as a whole was briefly discussed. It was shown to depend mainly upon those characters which cannot well be considered as the result of the summation of the characters of the zoöids composing the colony.

CURRENT NOTES.

For the first term of the academic year 1900–1901, the following University Extension Courses are announced:

Two lectures by Professor H. Morse Stephens, The History of University Extension in England; and The History of England's Government of her Asiatic Dependencies.

BOTANY: Six lectures by Dr. Osterhout. The titles of these lectures are as follows: The Problem of Water; The Problem of Light; The Problem of Food; The Problem of Air and Warmth; The Problem of Pollination; The Problem of Seed-Disposal.

ENGLISH: Four lectures by Associate Professor Syle: Ibsen; Rostand; Pinero; Augustus Thomas.

LATIN: Ten lectures on the Eclogues of Virgil, by Dr. Hopkins.

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PHILOSOPHY: Ten lectures on the Eighteenth Century Philosophers, by Associate Professor Bakewell. The titles of the lectures are: 1. The Background of Eighteenth Century Philosophy; 2. Voltaire; 3. The English Inheritance; 4. Condillac; Sensational Psychology; 5. Diderot and the Encyclopædia; 6. Helvetius; the Ethics of "Enlightenment;" 7. Holbach and La Mettrie; Materialism; 8. Rousseau and the Emotional Explosion; Romantic Optimism; 9. The Reactionists; 10. Summary of Results; Philosophical Evaluation of the "Enlightenment."

PEDAGOGY: Four lectures by Professor Brown on The Methods of Instruction. The titles are: 1. Instruction as a Social Process; 2. Instruction and the Training to Do; 3. Imitation and the Organization of Knowledge; 4. The Art of Teaching.

ORIENTAL LANGUAGES: A class in Japanese by Mr. Kuno, and a class in Cantonese by Mr. Fong. A course of lectures on The Chinese Problem will be given by Professor Fryer.

Professors Howison, Stringham, and Putzker, and Dr. Lewis have returned to active work in the University after the expiration of their leaves of absence; and the work of the University has been broadened and strengthened by the following new appointments: Alexander McAdie, Honorary Lecturer in Meteorology; H. Morse Stephens, Lecturer in Modern History (for the first half of the year 1900–1901); G. B. Wakeman, Instructor in History; E. M. Blake, Instructor in Mathematics; Leroy Anderson, Instructor in Dairy Husbandry; Anna Fossler, Cataloguer; N. L. Gardner, Assistant in Botany; W. J. Wythe, Instructor in Drawing; W. P. Boynton, Honorary Instructor in Physics; First Lieutenant H. DeH. Waite, U. S. A., Professor of Military Science and Tactics; C. R. Keyes, Instructor in German; A. S. Eakle, Assistant in Mineralogy; Lincoln Hutchinson, Instructor in Economics; C. A. Kofoid, Assistant Professor of Histology and Embryology (after January 1, 1901); F. F. Ellis, Assistant in Zoölogy (till December 31, 1900); W. H. Weslar, H. N. Cooper, and H. C. Bradley, Assistants in Chemistry.

Leaves of absence during the year 1900–1901 have been granted by the Regents to Professors LeConte, Jones, Lange, Plehn, and Cory, and until January 15, 1901, to Librarian Rowell.

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University Chronicle

VOL. III NOVEMBER, 1900 No. 5

THE PLACE OF PHILOLOGY.*

By BENJ. IDE WHEELER.

In the steady development and differentiation of the intellectual activities, especially during the century just closing, the peculiar discipline in whose name we are here to-day assembled has finally taken a shape and assumed an individuality which assert for it a place and area of its own, and establish some tentative boundary lines between it and its nearest neighbors, philosophy and history. The process of differentiation has been attended by one of selective coöperation, and auxiliaries like archaeology and scientific linguistics have tended to seek their place under the hegemony of philology.

The guiding power in these reciprocal processes of differentiation and of selective coöperation has not been derived exclusively or even principally from a theoretical determination of the proper scope and purpose of the related disciplines. The various definitions of philology which have had vogue, and particularly that of Boeckh, may have served some purpose in giving here and there direction to effort and determining division of tasks, but of vastly greater weight have been the facts, the actual facts composed of what has actually engaged the interest of individual philologists and of philologists as a class, under

*The President's address at the first annual meeting of the Philological Association of the Pacific Coast, December 30, 1899.

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the necessities of their teaching and through the bent of their minds as conditioned by the materials and methods of their study. A scholar's interests will in the long run conform to his studies, and his studies are prone to take the direction of what he teaches in the schools and of what he was taught in the schools. An *a priori* determination of what philology ought to be is likely to prove as vain as Gottfried Hermann's conclusion reached by eminently convincing philosophic reasoning and enunciated as a final dictum in his famous *De emendanda ratione Graecae grammaticae* of the year 1801, to the effect that the possible number of noun cases is by nature limited to the Latin six: "quandoquidem nec plures esse quam sex casus possunt, nec pauciores esse debent." A few years later the emerging science of comparative grammar mocked his metaphysics with the demonstration that the parent language of Latin and Greek possessed two cases, the instrumental and the locative, in addition to the six.

It has occurred to me that instead of attempting to locate philology on the barren ocean by aid of the stars we might traverse the land and find men at their work, so that we might perchance be able to report, not so much where philology ought to be and what it ought to do, as where philology is and what it is doing. If this attempt should assume the appearance of taking account of stock, it still could not be urged that the time is inappropriate, seeing that we stand at the portals of the last year of the century inspired by Wolff and Boeckh; nor again could it be urged that the *place* is inappropriate, seeing that we are assembled at the spot where Mediterranean civilization halts at its farthest Hercules' Pillars before taking the last leap into lands it has yet to conquer.

If we turn now to examine the work which is actually engaging the attention of scholars whose training and whose activity are called philological, we shall find a large proportion of that work applied in teaching the elements of foreign literary tongues or in studying with a view to giving

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these elements a clear and appreciable isolation. The mechanism commonly employed for teaching a language consists of the artificial classifications of descriptive grammar. The paradigms and other classifications of forms struggle toward arraying like form under like idea in a system which can at the best be highly incomplete, and which, in the presumption that like is like expressed, rests upon ultimate deception, and is therefore merely artificial. The rules of syntax are likewise an artificial grouping of apparently like phenomena, never complete, generally clothed in the guise of a pseudo-logic, and, in the presumption that different words representing different ideas can be fully united in a category such as subjunctive, dative, present, future, permanently false to the psychology of speech. The present *to hit* is a very different thing from that which we call present in the case of *to pound*. *Ye* is the plural of *thou*, but *we* is not the plural of *I*. Under the name subjunctive are assembled the most diverse ideas, their diversity being largely dependent upon the denotation of the word itself.

And yet, with all that may be said against descriptive grammar, it furnishes a tentative method of approaching and grasping the first phenomena of a language which as a practical device cannot be spared,—at least for those who have passed beyond the purely imitative stage of childhood. Adults and generally also youths above the age of twelve to fifteen require some pseudo-rational classification of the facts of language in order to appropriate them with the greatest readiness and certainty. The "natural method" involves for adults, when not combined with some teaching of classifications, a great waste of strength and time. Languages which are acquired in childhood by simple hearing and imitation, as additional to the mother tongue, do not appear to involve high educative value. The results incidental to a command of languages so acquired are of course not to be confused with the educative effects of the effort of acquiring. No better evidence is needed concerning the low

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educative value in the purely imitative acquisition of stranger tongues than such as is afforded by observation of communities situated at or near linguistic frontiers as in Austria or Switzerland, where a child learns naturally and without effort to speak two or three languages. The peoples of these communities show no indication of intellectual superiority. The first acquisition of language involves unmistakably for the child a supreme educative effort. The assorting and filling of the moulds of thought which accompany this acquisition constitute the educative value. The second childhood language, however, generally utilizes on the whole the same moulds; each phrase of one language comes to have its counterpart phrase in the other. The intellectual nerve is not quickened; the intellectual grasp is not toughened.

The chief educational mission of the teacher of the elements of language, if we overlook the results incident to the possession of a language as a tool, is to force the mind of the pupil into providing the new psychic moulds for the new language material. Here arises the question of translation and its educational value. If translation undertakes merely the bald transfer of words and phrases, it is a purely mechanical proceeding like the pasting of stamps into a postal album, and carries with it little educational value beyond quickening of the memory and the attention. It is likely to involve too a debasement of one's standards of expression in the mother speech. Good English translation is one of the most difficult of exercises, and consists of two distinct disciplines,—first, the complete, sympathetic grasp of the thought conveyed in the sentence to be translated; second, a serious effort,—and this belongs with English composition,—to express the thought, which has now become the translator's possession, with all its tones and colorings, in good English. Unless the second part can be done carefully, the teacher must resist all temptation to apply mere recitation tests and abide by the former, though he will do this at great loss, for a very large part of the "converting

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power" of language study resides in this much despised exercise of translation. Acquaintance with Greek thought, for instance, though an important educative aim of Greek study, cannot be counted the goal of Greek study *viewed as a linguistic discipline*. Constraining the English language moulds to receive the thought conduces toward the suppleness of thought essential to sympathy, which is the true goal. Thought that does not habitually yield itself to formulation in the linguistic moulds is apt to be, for the purposes of use in the organized society of man, vague and profitless.

In continuing our examination of the work which occupies philologists, we should find a considerable body, particularly in this country and perhaps more among Latinists than among the representatives of any other branch, devoted to the investigation of the higher problems of syntax. The impulse to this form of work has arisen less from the desire to penetrate into the thought expressed by the language than from the desire to formulate into quotable types the usage of a language whose thought has been already keenly and sympathetically felt. The task is to identify the prevailing types of word-combination existing in the organization of the sentence. When the work extends to the observation of these types as they extend or decline, and to the determination of which is older, which younger, and possibly to investigation of the causes of extension or decline, it is called historical syntax. Comparative syntax is its occasional auxiliary. These prevailing types which it is the object of syntax to determine cannot, however, be held to represent types or moulds of folk-psychology, as it was once the dream of Lazarus and Steinthal to demonstrate, except so far as such psychology was itself the product of the language and the peculiar combinations in its mechanism. The best which syntax therefore can hope to attain is the identification of certain general ruts or grooves which the combinations tended to follow, but with the certain limitation that like forms of

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words of different meaning are not committed to like grooves. The effort expended in this identification tends to induce a careful observation and fine discrimination and leads toward the determination and summarizing of those conventional types of word-combination, which, however they may have been created, condition, restrain, and mould the popular thought. Therein lies the advantage of syntax as a discipline on the one hand, as a science on the other. If conducted, however, on the assumption, implied or expressed, that logical principles accessible through metaphysical reasoning are involved in the formation of the types, nothing but mischief can be wrought for teacher, text, and taught.

The study of historical grammar in the form of comparative morphology and phonology has yielded tribute on the one hand to the general science of language, on the other to philology. As tributary to philology it serves the purpose of showing how the outward form of language is historically conditioned. By distinguishing the old from the new and establishing a chronology of form-development, it furnishes syntax with its only sure foundations, and provides one of the only two possible bases for a real classification of language-phenomena. The other possible basis is not that of descriptive grammar, which is utterly artificial, and neither scientific nor popular, but is that of the folk-consciousness, of the language as it rests untouched by reflection in the mind of the folk. Classification upon this latter basis, all-important as I believe it will yet prove to be, has not yet been attempted, owing to lack of competent observation of the facts. Psychology is still too young.

The earlier enthusiasms of historical grammar, nurtured upon the hope which came to its baldest expression in the work of Schleicher, that the science of language might follow the ways of the natural sciences, have been of late years, it is true, somewhat chilled, as deeper penetration into the true nature of speech has revealed that the science takes its place perforce with the historico-social sciences. The results

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of the study may not prove to have either the range or the certainty which was at first expected of them, notably in their applications to the fields of ethnology and comparative religion, but it is unmistakable that the science is rapidly finding its true place, and that that true place leaves it in closer sympathy with the established methods of philology. They both in the last analysis deal with uniformities and laws which represent social compromises due to the surrender of individuality in the intercourse of masses of men brought together in historical life.

Historical grammar as dealing both with the moulds of form and with the combination-types of syntax will prove to be inseparable from philology and indispensable to a philological equipment. It is particularly essential that the teachers of the elements of language should be thoroughly trained both in the principles governing the life and growth of language in general, and in the history of the language they teach in particular. It is essential in order that the artificial classifications which for pedagogical purposes they are compelled to employ may never assume the position of real things either with teacher or learner; that is to say, it is particularly essential *for the very reason* that historical grammar and the so-called comparative philology *cannot* be taught to beginners. The arbitrary introduction of tidbits of historical grammar and of syntactical lore into an exercise of interpretation when they do not directly serve the purposes of interpretation is simply grotesque pedantry. The exaggerated attention paid to syntax at present in American class-rooms of Greek and Latin constitutes the severest menace to the usefulness and therefore to the continuance of classical study which now exists.

The seminaries and to an undue extent also the lecture-rooms of Germany are at present dominated by the exercise in textual criticism which constitutes as much of a menace there as syntax does here. Both are, however, a menace only in their disproportion. Both are the handmaidens of hermeneutics. Both give skill and certainty of grasp in

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interpretation. Conscientious interpretation will insist first of all upon knowing what is written. Among the divergent traditions of the text it will seek for some reasonable ground of choice. The διόρθωσις (*recensio*) will precede every attempt at independent interpretation. As sympathy with a text and its author's thought advance, the temptation to occasional exercise of the divinatoric criticism will arise. Such criticism indeed, though the chances are always heavily against its success, has its place as part and parcel of the *interpretation*, but is never an end to itself. The practice of seminaries in framing conjectures has undoubtedly served much purpose in sharpening wits and enforcing reflection, but it has also served to encumber would-be scholarship with vast accumulations of hopeless lumber. An exercise begun with the purpose of aiding interpretation has to a considerable extent become an end to itself and led philology out upon the arid and trackless deserts of pedantry.

In the exercise of the various tasks to which we have thus far alluded it may be questioned whether philology has not turned its look too far away from what we ordinarily understand by literary study. Philology concerns itself primarily with literary documents. Its professed traditional aim is the interpretation of literary documents or of a life betrayed most fully in such monuments. If it fails of reaching this goal, it will be held to have failed entirely,—at least in the court of common judgment. If it spends all its time and all its strength in sharpening and whetting its tools for that which is to be its ultimate work, it will be looked upon as either a visionary or a deceiver, a fool or a fraud.

Literary study may be either the study of a fine art whose material is language,—in which case it is a branch of aesthetics,—or it may be a study of the ideas and forms of thought involved, in which case it can hardly escape becoming a branch of history through its dependence upon historical modes for an understanding of these forms. The

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almost complete differentiation of historical studies from philological, which the present century seems to have brought about, has as a matter of fact robbed philology of its historical power. The training and tastes of the men who have actually represented the philological activities have not led them into sympathy with the historical point of view. They have left this under the division of labor too exclusively to the professional historians. Here we have then an unmistakable and most emphatic illustration of the view that the scope of philology is determined not by theoretical definitions so much as by the actual tastes and occupation of the men actually engaged in its pursuit.

The philologist in his painful concentration upon the details of fragments and his absorption in the task of restoring a condition which belongs to a single time and status has undoubtedly lost something of that power of perspective which a consideration of the historical meaning in reference to conditions related by succession in time is alone able to impart. While therefore it is evident that he cannot afford to yield entirely the historical point of view, it must however be remembered that he is primarily concerned with restoring a condition which exists in a single plane rather than in establishing a line of descent. The historian will utilize his results. From the philologist the historian will learn atmosphere. From the historian the philologist will learn perspective.

Absorption in the task of teaching the elements of language and mastering the various branches of linguistic study has furthermore diverted the average philologist from literary aesthetics. In the philological class-rooms of Germany and America pure literary study has been reduced dangerously near to a minimum. The influence of the methods employed during the past century by the natural sciences has been undoubtedly in a measure responsible. On every hand one marks the effort to establish aesthetic criteria by measuring and counting and classifying. A large japanned tin box full of cards provided by the

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cunning of the Library Bureau will not however yield with unerring and mechanical certainty its expected semestral output of literary taste.

We have been speaking of the way in which the actual facts of the experience and interests of those who are called philologists have served to determine the place and definition of philology. An example of this has been afforded in the last two decades by the new animation imparted to classical study through men who have studied at Rome and Athens. Most of the students who have pursued archaeological studies in connection with the American schools at Rome and Athens have on their return to the practical work of teaching become perforce philologists rather than archaeologists. There has not been a sufficiently large demand for archaeological specialists to absorb their work for this distinctive field. Philology has been thereby the gainer. Contact with the habitat and the material remains of ancient life has quickened in these men a sensitiveness for this life as real. They have become interpreters in a more direct and definite way. They have brought new materials to bear in the task of reconstructing the thought and form of ancient life out of its fragmentary remains. The very fact that these men have been absorbed into the philological mass through the accident of conditions that temporarily at least forbade the fuller organization of archaeology as a clearly differentiated discipline has served to widen and enrich the practice and consequently the conception of philology. If we admit that philology has indeed no boundaries established in the inherent nature of things, then is it true that the fact has actually enriched and widened the very definition of the term.

Without proceeding further in our illustrative survey of the field actually occupied at present by the activity of the representatives of the discipline, let us turn to a precision and summary of its significance based upon what we have observed and what we in general know as to that field and its work.

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The work is in the first place characterized by the necessity under which it labors of restoring and reconstructing a whole out of fragmentary materials. The literatures as rescued monuments of a past are in themselves but fragments and parts. Out of the entirety of Greek literature for example has been rescued only a few samples, a few such as the needs in the main of the rhetorico-philosophical schools of antiquity selected as worthy of duplication and consequently of preservation. Chance has had its say to some extent, but on the whole the texts read in the schools are those that have been thus preserved,—a little school library of standard epics, lyrics, dramatics, historians and philosophers. From these and their allusions and citations we have to restore an impression of the contents and purpose and tone of a vast literature. Even the rescued texts are battered, torn, and shop worn, and must be the continual objects of a study that guides through a schooled and chastened imagination to a realization of the original.

The language has not been preserved either in living voice or in completed thesaurus, but must with painful labor and patient collecting, sifting, classifying, be reassembled from the leaves of parchments and papyri and from fragments of stone, and find its meaning through the interpretation of texts and the searching of feeble glossaries and the collating of the chance scribblings of the scholiasts.

The restoring and reading of the inscriptions represents most sharply and concretely the work of the philologist. From three dim letters on a *stoichedon* inscription the epigraphist divines a word, and with the help of his knowledge of the formulas and by counting the spaces fills a line; so that often from the rescued edge of a stone he reads a whole, four and five times the extent of the given material.

This applies to the entire field and method and work of philology. What the architectural archaeologist does in restoring the plan and conception of an ancient building by

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help of a few column drums, a few intercolumnar spaces, traces of a foundation wall, and fragments of an architrave or cornice, the philologist must do with fragments of a structure of human thought. The harmonies and measurements yielded by the column-drum and cornice-fragment are represented by the spacing of letters or the moulds of metre or the trend and continuity of the thought divined. Throughout there is demanded the most accurate knowledge of all that reconstruction has yet accomplished and a divining imagination based thereon and able to throw its cantilevers out into space. Herewith we may characterize and identify most surely the philologist's work.

He deals primarily and principally with language, the language that expresses and sets forth the life of a culture that has lapsed into the past, but which had a unity, and harmony, and measures inhering in an established and solidified scheme of conventional historical life. That which links together the exercises of advanced investigation such as the philological specialist pursues and the first efforts of translation and interpretation such as occupy the beginner in the study of language is this essentially characteristic method of divining a whole out of incomplete data. The boy who is laboriously collecting the data afforded by case and tense and word-order and with help of the known harmonies and measures yielded in the ascertained moulds of syntax, is restoring, however crudely, a meaning for the sentence, is doing the work and receiving the training which belong to all the endeavors of philology. Out of data that at the best will always prove incomplete, he is divining the vanished whole. The educative power of the exercise inheres first in the constructive effort of assembling the materials; second, in the use of the memory for aiding the assemblage; third, in the intelligent direction of the imagination toward reconstruction; fourth, in the cultivation of the power of contingent reasoning. The fourth is akin to the third, and together they constitute the all-important educative and uplifting power of language-study.

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Contingent reasoning is the form of reasoning we apply almost exclusively in the practical doings of life. It is life-reasoning as distinguished from absolute or mathematical reasoning, and as such it is the form of mental reasoning most available for use, most essential to effective living, and most desirable to cultivate. As language is the most potent educator of the child, so it has always been of the race. It represents in its very texture the thought and the reason of the natural man, and is the most human thing produced by human men. Mind is thus naturally nourished during its growth by a food which is itself a natural product of mind. Life is fed by life.

The existing place of philology among the learned disciplines has been established and defined by the facts of educational practices and the demands of learned study in connection therewith quite as much as by any logically determined boundary marks.

The tradition of the schools as formulated by the Renaissance appointed its general scope. The successive differentiations whereby other disciplines like philosophy, history, archaeology have been created out of its body have narrowed its field and intensified its vision even to the encouragement of dangerously narrow concentration. The surrender of history has wrought temporarily at least some mischief, as has also the loss of control over instruction in the vernacular which prior to the development of departments such as English composition, or "English" outright, rested chiefly in the hands of the classical philologists. Those who to-day contend for the old classics as affording the true cultural course of study, in spite of the limitation to a small range of subjects, do so in assertion of the old undivided claim. They still propose to teach many of the differentiated subjects incidentally or as latent in the body of the whole. Whether they do, depends as it always has, very much upon the teacher. If the modern specialized philology is taught, however, it will not be culture that results, any more than from the teaching of other

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specialized subjects. The real question at issue is not so much one of subjects as of the period for introducing the differentiated and specialized types of the great civilizing and educating subject,—human thought in the life-form.

After all delimitations have been reckoned with, and all the readjustments have been effected, there remains for philology a well-defined place and task. Language is its chief material. The life-thought of a people is its chief object of study. History, geography, art, antiquities, manners and beliefs, institutions and government,—all of these it must understand and utilize for its interpretations, but it is through language as the open window that it must look straight in upon the life and with the straight, whole look of sympathy learn to comprehend and relive it.

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KING ALFRED AND HIS MILLENARY COMMEMORATION.*

By Louis Dyer.

Loyal republicans though we are, we Americans can still find something to suit our mind in the words used, twenty-odd years before America was discovered, by Sir John Fortescue to the young and ill-starred Edward, Prince of Wales, killed at Tewkesbury about a twelvemonth afterward. The exiled Chief-Justice, instructing this exiled Lancastrian prince, quotes Holy Writ in declaring it "the office and duty of a king to fight the battailes of his people, and also rightly to judge them." Fortescue's words are all the more sympathetic because he did not hold with King James II that "The state of Monarchie is the supremest thing on earth." In fact Sir John Fortescue's mood was the very opposite, for his account of the office and duty of a king harks back to the clamors of Israel refusing to obey the voice of Samuel and shouting: "Nay, but we will have a king over us; that we may be like all the nations; and that our king may judge us, and go out before us, and fight our battles." But still it behooves us as Americans and republicans to remember John Eliot's preface to the Christian Commonwealth, where the Indian Apostle says, in comment upon the same verse of Samuel cited by Sir John Fortescue: "When a Christian people are to choose a government,

*Address before the English Department of the University, in the Harmon Gymnasium, November 13, 1900.

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should they take their patterne from the nations of the worlde? We know what an offence that would be to Christ, who intends to rule them himself by his own divine patterne and direction." Now Fortescue, little as he inclined to magnify the office of king, was far removed from 'Commonwealth' days, and his old-fashioned theory of the 'rights of man' lurks behind his declaration that "just as out of the embrion riseth a body naturall ruled by one head, even so of a multitude of people ariseth a kingdome, which is a body mysticall grounded by one man as by an head." In the 'mysticall' body 'politique' as thus conceived, the relation between king and people is explained as all the more intimate and all the more indissoluble because "the King of England cannot change the lawes at his pleasure." Pym takes this view in his arraignment of Strafford, saying: "The Laws of this Kingdom have invested the Royall Crown with power sufficient for the manifestation of his goodness, and of his greatness," and much else even more explicitly identical with Fortescue's doctrines.

The reason why the king may not change the laws at his pleasure was first given by him whom Old Chroniclers delight in styling quite unwarrantably "the first king of all the English,"—Alfred, when in the preamble to his laws, he explains that no new laws have been added in place of certain ones of his predecessors, omitted with the advic^{e} and consent of his wise men, "because I could not know whether those who came after us would approve." Here Alfred characteristically eschews the royal plural, using us, as always, for himself and his wise men. The antiquity in England of this dictum that the king cannot change the laws at his pleasure makes it tolerably clear that Sir John Fortescue had in his mind when he discussed the office and duties of a king something more than a Bible text. We must fancy that he, too, like Pym in arrainging Strafford, and most explicitly our own William Penn in defending his good right to hold a meeting in the London streets, associated the goodness and greatness of Alfred with the liberties

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of Magna Charta, and the immemorial immunity of Englishmen from arbitrary rule. Indeed, without Fortescue, who certainly does not mention Alfred, the roll of those who dwelt fondly, at moments of intense political feeling, on dim records of the Old-English kings, to whom they instinctively ascribed just the perfections which the momentary crisis called for, is a long one, and includes the colonists of Ann Arundel County in Maryland. This habit of retrospection began rather ludicrously under Henry II, William the Conqueror's youngest son, in the lives of that feeblest and most incompetent of Alfred's direct descendants on the throne, Saint Edward the Confessor, which glorified in him the good old days before the Conquest with little or no regard for historical facts. The same inveterate habit declared itself in Bradshaw's stern reproof of Charles I at his trial; and Englishmen still indulge in it. As time went on Saint Edward bulked less and Alfred more in these retrospections, and of Alfred we can truly say that none of all the unhistorical and enthusiastic improvisations about him make him out greater or better than the unvarnished facts would warrant. "Even his legendary reputation," said the the late Professor Freeman, "is hardly too great for his merits."

We have indeed authentic records showing that no king ever performed the two essentials of fighting the battles of his people and rightly judging them more strenuously than Alfred. Much in the long-accepted record of his reign has proved apocryphal and been called in doubt, but not his love, not his self-devotion. The chief things that tell against him are the result of his superlative excellence, and people quarrel with his memory nowadays because so many enthusiastic eulogists have, for the love of him, bid defiance to human possibilities and probabilities; so many clumsily invented anecdotes, like that of the burnt cakes, or of his expedition inside the enemy's lines disguised as a harper, have obtained currency; so many glorious institutions of which he never dreamt, such as trial by jury, the British

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navy, the subdivision of England into shires, have had Alfred thrust upon them as their founder. All this now envelopes him in an atmosphere of controversy which not only is repugnant to his straightforward and uncomplicated character, but, what is worse, obscures his really glorious achievements quite as effectually as did the feeble improvisations about him which our fathers looked upon as true. That Alfred himself would have grieved bitterly at such a state of things is plain enough from words all his own and not at all warranted by the particular passage of Latin which he is translating, in the thirteenth chapter of his Old-English version of Boethius. There, as if foreknowing that his good name might some day require vindication, he says: "It is abundantly manifest that the good word and good fame of every man is better and of dearer worth than any wealth. . . . His heart's secret places it opens and breaks through the bars of his neighbor's heart, and in the way between them it is not belittled, nor can any man with sword slay it, nor with rope bind, nor does it ever perish." Again in the seventeenth chapter of the same work, he breaks away from his Latin text to make what might be considered his own plea for fair treatment at the bar of posterity when he says: "It behooves me in all truth to say that my resolve has been to live worthily and to leave to men who should come after I have lived a remembrance of me in good works."

We may then almost say that Alfred himself will rejoice with us if we can say that there are good works of his enough and to spare which are clearly known quite apart from all pettifogging controversies and debates of doubtful issue. More than Alfred's unremitting fulfillment of Fortescue's whole duty of a king, more than his steadfastness in war, more than his unwavering justice in peace is incontrovertibly known to us of Alfred. He devoted himself to study, late in life and under the most incredibly adverse conditions, with an aim so high that, to quote from Pauli, his ablest German biographer, the like of it "was entertained

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by no earthly ruler before his day." Looked upon from this aspect, his high conception of the duties of kingship and the remarkable abilities which it called into play, place him by the side of Marcus Aurelius and entitle him to the Platonic designation of 'philosopher-king.' After the alarums and affrays were growing fewer, which made the first half of his reign a veritable 'Dance of Death,' Alfred devoted to study and to authorship such of his energies as could be spared from "the various and manifold worldly matters which constantly preoccupied his mind and strained his bodily powers," to quote from the Old-English preface to his Boethius. He was resolved to give his people means of self-improvement. This most unique interest of his would certainly have commanded the sympathy of Charlemagne, but Charlemagne, his grandfather's friend, lacked a certain strain of Celtic suppleness in mind which Alfred obviously possessed. Charlemagne had the will but not the abilities of Alfred in the matter of books and book-learning. Alfred's aims and achievements in literature are vouched for by no doubtful or hearsay evidence: we have his books as the result, and we know that he was the framer of the first Old-English prose. Furthermore, he has explained his motives for becoming an author in his own preface to the the most minutely wrought of all his translations from the Latin, his Old-English version of the book which "is called in Latin Pastoralis, and in English Shepherd's Book," * that is, the Pastoral Care of Pope Gregory the Great, for whom, as the pontiff who decreed the conversion of England, Alfred's gratitude and reverence were unbounded. "The wise Gregorius," says Alfred, "was versed in many true doctrines through the wisdom of his mind, his hoard of cunning thoughts. For he gained over most of mankind to the Guardian of Heaven, best of Romans, wisest of men, most gloriously famous."

When we read Alfred's preface to this translation, he

* I have used Mr. Henry Sweet's translation, published by the Early English Text Society.

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unlocks his heart, and, along with his reasons for this and other works, gives us certain especially interesting autobiographical glimpses. "It has," says he, "very often come into my mind what wise men there formerly were throughout England both of sacred and secular orders; and how happy times there were then throughout England; and how the kings who had power over the nation in those days obeyed God and his ministers; and they prospered both with war and with wisdom." Alfred speaks whereof he knows, for the kings especially alluded to are his grandfather, King Egbert of Wessex, the 'Wielder' or Overlord of all Britain, and his father, Ethelwulf of Wessex. Egbert was above all a fighting king, but his son Ethelwulf, in the nineteenth year of his reign gave the tenth part of his land "for the glory of God and his eternal salvation. And the same year," says the Old-English Chronicle, "he went to Rome in great state, and dwelt there twelve months." But to resume the interrupted preface, Alfred goes on about the good old times, and "how foreigners came to this land in search of wisdom and instruction, and how we should now have to get them from abroad, if we were to have them." Then we hear more of the decay of learning, and Alfred says there were very few "on this side of the Humber who could understand their rituals in English, or translate a letter from Latin into English. So few," he adds, "that I cannot remember a single one south of the Thames when I came to the throne. Thanks be to God Almighty that we have teachers among us now." Between these lines we read plainly enough that, in Alfred's day, all teachers were of the clergy, although many of the clergy were untaught. Not even all Bishops could be depended upon for learning. The incapacity of the Old-English for letters was so marked that Alfred's literateness is the most conspicuous among several signs indicating that he was partly Welsh. How he himself got his learning and did his work appears at the end of this preface, where he explains that he began translating from Gregory "sometimes word

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by word, sometimes according to the sense," as he had learnt it from Plegmund, his archbishop, and Asser, his bishop, and his mass-priests, Grimbold and John. Furthermore, he anxiously provides for sending a copy of his translation to every minster in his realm, and that no man "take the book from the minster, as it is uncertain how long there may be such learned bishops as now, thanks be to God, there are nearly everywhere." Alfred thanks God for his learned bishops, but he himself took endless pains to secure them. Asser he lured from St. David's in Wales, and made of him his bosom-friend. His policy was to be on the lookout for learning or the promise of learning, and when he found it in any man to see that he duly qualified himself, and then to make a bishop of him. Indeed, there is a moderately authentic case, besides Asser's, to show how Alfred's policy in this regard was carried out. Although it appears that the story of Alfred's letting the cakes burn and incurring the reproof of the wife of a swineherd in the neighborhood of Athelney, is an embellished episode in the flimsy legend of Alfred reclaimed by St. Neol from sowing wild oats, there is yet something of importance lurking behind this improving fiction,—a story about a swineherd given as of common report by Florence of Worcester. This story has it that Alfred made friends, during his dark days in hiding near Athelney, with an unlettered swineherd whose turn for letters so impressed the king that he took his education in hand, and finally the swineherd, Denewulf by name, became Alfred's Bishop of Winchester. If not true, the story at least serves to enforce the truth that Alfred was always on the lookout to find possible appointees for his bishoprics, and this amounted in his day and generation to what in ours has become the endowment of research.

Reverting once more to our much interrupted preface, the golden times so feelingly described by Alfred went back, according to Alfred's view, far enough, no doubt, to include the Venerable Bede, who lived north of the Humber,

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but whose pupil, the great Alcuin, went from York to enlighten the realm of Charlemagne in the days of Alfred's royal grandfather, Egbert. What is important for us to keep in mind is that between the days of Alfred's childhood and earlier youth, and the time when he came to the Wessex throne, in 871 A.D., the ghastly shipwreck of learning and holy-living, over which Alfred mourns, had overtaken England. "I saw," Alfred goes on to declare—always in the same preface to the Shepherd's Book of Gregory the Great—"I saw, before it had all been ravaged and burnt, how the churches throughout the whole of England stood filled with treasures and books." Before we turn back from the middle to the beginning of Alfred's reign to look closely upon the tragic outset of his kingly career, let us go still a little farther, hand in hand with him, into the statesmanlike preoccupations of his later years. The final remedy for all the havoc wrought in England by the heathen Danes occurred to Alfred and was put by him before his bishops,—to whom was addressed the whole preface under our continued consideration,—as follows: "It seems better to me, if ye think so, for us to translate some books which are most needful for all to know into the language which we can all understand, and for you to do, as we very easily can, if we have tranquillity enough." Mark how his 'you' becomes 'we,' and note with what convincing earnestness he strives to gain the bishops' good opinion for his plan, and yet how the fear of more pillaging and maurading Danes is always lurking behind every plan and mocking every hope. What Alfred now goes on to say is the root of the whole matter and is thus propounded by Alfred: "that all the youth now in England of free men, who are rich enough to be able to devote themselves to it, be set to learn, as long as they are not fit for any other occupation, until they are well able to read English writing, and let those be afterwards taught more in the Latin language, who are to continue learning and be promoted to a higher rank." Alfred had no illusions. He knew his

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Saxons well, and did not dream of schooling for any man among them who was fit for any other occupation. His Utopia, where the privileged few, the very rich, might hope with great pains and lavish expense to learn to read English writing, may provoke a smile, but it assuredly speaks volumes for the backward state of the Old-English in his day. He does not so much as suggest that any one be taught to write, nor is this unnatural, since, like Charlemagne, he himself fell far short of being a scribe. The huge seals and the signs of the Holy cross, which are appended to Old-English documents of his day may serve as a commentary upon Alfred's omission of any plan to teach the noblemen of Wessex the vexatious art of writing.

However that may be, Alfred's programme of 'Secondary Education for England' just quoted, is all, excepting perhaps the coins struck at Oxford in Alfred's name and with his effigy, that now is left of that marvel of the days of Queen Elizabeth and King James,—Oxford University (or more especially University College, Oxford, founded by Alfred the Great in the ninth century after Christ. To be sure, we may, if so inclined, take seriously a curious passage in Asser's Life of Alfred, where we read that the good king of Wessex devoted annually one-eighth of his total income "to the school which he had studiously collected together, consisting of many of the nobility of his own nation." But he who believes all this must be able to tell us who was Alfred's Chancellor of the Exchequer. Moreover, he must go on with the further statement that the same Alfred devoted another eighth of his yearly income to monasteries "in all Saxony" (Saxony in the mouth of a Welshman, like Asser, means simply Wessex) and Mercia. Oxford was undoubtedly in Mercia. There is a certain amount of rather shaky evidence showing that St. Frideswide's at Oxford was founded many years before Alfred. Accordingly some part of this second eighth of Alfred's revenues might be supposed to have gone to support the school at St. Frideswide's, if the attested fact that there was a school

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at that monastery two hundred years after Alfred's day could persuade us that the school existed there under Alfred when Oxford was a favorite haunt of the Danes. On the whole, this excursion into the regions of the highly improbable is not likely to yield profit, and the safer plan by far is to conclude that the whole account of Alfred's exchequer in Asser's life originated in the subtle mind of some astute ecclesiastic anxious to encourage millionaires in his own day to emulate the paragon of English kings in generous donations to the Church. Alfred founded no Oxford colleges, endowed no Oxford professorships. Nothing, in fact, remains of his whole educational plan, except the essence of it, his intense conviction that national life without national education is suicidal for man because it cuts him off from the right worship and due obedience of his Maker. Those who know modern Oxford best see most clearly how much is there patriotically sacrificed to the needs of the nation, how much is done in order to man the British Empire. If performance of this duty may go to prove foundation in Alfred's spirit, then indeed not Oxford only but also its sister university at Cambridge must have that glory. On the other hand, if we scan the whole range of English history, old and new, at home and in the colonies, the closest parallel to Alfred's educational proposals, made to his bishops under such unpromising and disheartening circumstances, will be found in the earliest move made to establish a school in the Colony of Massachusetts Bay,—in the founding of the Grammar School which so soon became Harvard College.

In turning to the dark days when England was all but wrecked by the Danes, and Alfred, after the successive deaths of all his three brothers, ascended the tottering throne of Wessex, the first cause for admiration is that the man had courage enough to think of reigning at all. The 'golden' words, addressed to her last parliament by Elizabeth, might well have fallen from Alfred on the day of his accession. "For my own part," said the aged and outworn

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queen, "were it not for Conscience sake, to discharge the duty that God hath layd upon me and keep you in safety, in mine own disposition, I should be willing to resign the place I hold to any other, and glad to be freed of the Glory with the Labours." Labors enough and to spare, Alfred had already had, before he became king in 871 A.D. The political situation of the Anglo-Saxons in England, when history repeated itself, and their own invasion of three hundred and fifty years before began to be reënacted, to their dismay and at their expense, by men of their own race in 794 A.D., was practically that of Israel in the Land of Canaan, which is described in the books of Joshua and Judges. The seven kingdoms of the so-called Heptarchy, into which we used to learn that the Old-English were neatly subdivided, are almost as mythical as the seven sons of the god Woden from whom the kings of the Heptarchy are fabled severally to have descended. The use of the term king among the Old-English of those days is strictly parallel to its use in the eighth and four following chapters of Joshua. How unfixed its meaning was, even in the the mind of Alfred, himself a king, and living more than a century later than the first inroads of the Danes, he shows us in his translation of Orosius,—an historical summary by various hands which became, before Alfred had done with it, a sort of Old-English Gazetteer of Geography, History, and Antiquities. In that translation he reproduces the words 'consul,' ,dux,' 'praetor,' and 'pro consule' all by the Old-English 'cyning,' *i.e.*, king. The Saxons, Jutes, and Angles in their first homes beyond the German Ocean, and the Anglo-Saxons during the first four hundred years of their abode in England, like the Israelites in Egypt and in Canaan up to the anointing of Saul, had not yet risen to the conception of a single king ruling them as one nation. Edward the Elder, Alfred's son and successor, was indeed the first king of all England, fused into one national mass in the crucible of adversity. The invading Danes brought this to pass. Alfred's dominion was strictly speaking Wessex, the south-

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western corner of England, to which he added Mercia,—a district comprising the lion's share of Midland England from Wales to the German Ocean,—where Alfred's father-in-law was a man of consequence.

Alfred was married at twenty, three years before his accession, and had hardly led his bride home to Wessex before he was summoned back to Mercia without her in order to begin his life-long struggle with maurading Danes by laying siege to the town of Nottingham, where he had just been married. Next year, in 869 A.D., the cloister at Bardeney, Croyland Monastery, Peterborough, Huntingdon, Ely, "filled with treasures and books," were looted; and East Anglia,—Norfolk, Suffolk, and Essex,—was appropriated by Guthorm the Dane in 870 A.D. Then came the attack on Wessex. Defeated at Reading, the Wessex men, with whom were Alfred and King Ethelred, his brother, met the foe again four days later, and won the glorious victory of Ashdown, not far from the 'royal vill' of Wanating (Wantage) where Alfred was born. Ashdown was Alfred's victory, achieved in spite of the refusal of Ethelred to come away from hearing mass when fighting began. In a fortnight came the drawn battle of Basing, and soon after the hard-contested field of Merton, won by the Danes. Ethelred then died, early in 871 A.D., and Alfred, now the only possible King of Wessex, hurried from burying his brother at Wimborne minster to make a muster and a stand against more Danes just swarming in upon Reading. His previous army had melted away and were tilling their fields, and gathering a new one caused a month's delay, after which Alfred was badly routed at Wilton; so badly, that he bought off the Danes. But they did not keep faith and would not 'stay bought,' so that the endless struggle, with cruel and incessant ups and downs, went on indefinitely. Its further details shall not be given here. We have indeed Alfred's own authority for shirking such tedious minutiæ of wars, for in his Orosius, toward the close of the fifth book, he suddenly takes the bit into

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his mouth and runs away from his account of Roman warfare, remarking somewhat abruptly: "I shall grow weary of these Roman wars." Indeed, already as early as the fourth book, at the close of its eleventh chapter, he shows palpable signs of restiveness, where he says: "And there were many wars in those days in many lands, which it is now too tedious to relate."

During the first eleven years of his reign, Alfred was never sure of his life. Before then, he and his brother Ethelred altered their disposal of the family property for the avowed reason that they were in hourly danger of slaughter. No wonder then that Alfred was so appealed to by the tale of Damocles and the sword suspended over him by a thread that he interpolated it the twenty-ninth chapter of his Boethius, although Boethius has no mention of it. "Therefore," says Alfred, "a certain king formerly said: 'O, how happy he over whose head hangs not always by a small thread a naked sword, as over mine it ever yet has done.'" Alfred's catastrophe came like a bolt from the blue in 878 A.D. The Danes "stole away to Chippenham," says the Old-English Chronicler, "and overran the land of the West Saxons." Many were driven beyond the sea, "and of the remainder, the greater part they subdued and forced to obey them, except King Alfred." This was the moment when Alfred fortified himself in the wilderness of Athelney, a marshy district on the Parret, where he afterwards founded a monastery, not far from Glastonbury. It was in these parts, indeed, that 'Alfred's Jewel' was found in the 18th Century.

The reason why Alfred suddenly took to the woods must have been due to the very same cause which kept him waiting a whole month after Ethelred's death before engaging the Danes. His levies melted away after the expiration of two or three months' service, whereas the Danes had nothing to call them home; summer and winter through it was their only concern to fight and plunder. And thus we see that Alfred's darkest trial came to him through the

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same insurmountable difficulty which our own Washington had to encounter, and that the same cause which drove Alfred into hiding came within an ace of ending our War of Independence, with independence yet unachieved.

All manner of legends center around Alfred's twelvemonth spent at Atheleney. The tale of the burnt cakes is only one of several. But these myths need not detain us. Here however is the opportunity for noting how keen and genuine was the feeling for the woods and for every subtle change in the growth of plants and trees, which Alfred gained, presumably in this long period of hiding. The evidence of this we again find in a passage where he parts company with Boethius, interpolating the following. "Why may'st not thou perceive that all the part of a tree that waxeth in twelve months beginneth its upward growth from the roots into the trunk, and then along the pith and along the bark to the head, and thereupon through the boughs until it springs out in leaves and in blossoms and in fruits. . . . This thou mayest observe, how trees on the outside are shielded and clothed with their bark against winter and stark storms; and also against the sun's heat in summer."

Alfred's proceedings when he extricated himself from the wilderness and reassembled his men, leading them to a decisive victory at Hedington, or Edington, in Wiltshire, after mustering them on the verge of Selwood forest, are rather oddly explained by Pauli. A tower has been erected in our times on a hill not far from Wincanton, known and seen far and wide as Alfred's tower, to mark the neighborhood where Alfred's newly heartened forces gathered around him when he emerged from hiding at Athelney. The actual gathering-place was Egbert's stone, now Brixton-Deverill, in Wiltshire. Pauli says that Alfred "doubtless unfolded his standard—that golden dragon which once shone in battle against Mercians and Britons." The dragon of Wessex no doubt sounds well in opposition to the raven on the opposing Danish standard, but Alfred is rather

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unlikely to have kept such a thing about him in the wilds of Athelney: it seems plausible to assume rather that he summoned all-comers by sounding something like a horn. There is in the laws of Ina, a noteworthy predecessor of Alfred on the Wessex throne, a severe penalty enacted to meet the case of anyone lurking near a settlement without notifying his presence by sounding a horn. For Alfred's purpose, however, something capable of carrying further than an ordinary horn would be needed. Such is the 'blowing stone,' shown to-day at the front of a wayside inn near Uffington-Castle and the 'White-horse hill' in Berkshire, the county of Alfred's birth. It is an erratic boulder like many a one scattered on the hills in these parts—the people call them sarzan-stones. This particular stone has curious cavities in it, and a very moderate blast, blown by a girl of twelve into one of its orifices, produces sound of just the quality and carrying power possessed, as ocean voyagers know to their cost, by the fog-horns used on North Atlantic liners. Some analogous instrument for assembling a host would have suited Alfred's emergency better in every way than the Dragon of Wessex, for he needed any men he could gather, Welshmen and Britons quite as much as Englishmen, and only the latter could have cared to rally round the Dragon of Wessex.

We may, then, think of Alfred and his call to arms at Egbert's stone as we think of Ehud at Seirath, where he "blew a trumpet in the mountain of Ephraim, and the children of Israel went down to him from the mountain, and he before them." It was certainly quite in character and suitable to the emergency, if Alfred said to his men of the heathen Danes, as Ehud to Israel of the Moabites: "The Lord hath delivered your enemies into your hand." This whole chapter in Alfred's history was such as to efface the long-standing enmity between Welsh and Saxons that had paralyzed his earlier struggles against the Danes. While at Athelney, Alfred was in just the situation long familiar to the Welsh in their desperate struggles against the

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Saxon invaders. Indeed, Alfred's whole experience at this time, including its triumphant issue, was foreshadowed two hundred years beforehand in the adventures of Caedwalla, a Welsh-Saxon or Anglo-Celtic adventurer who long lurked in hiding a good deal to the north and east of Athelney, in the forests of Chiltern and Andred, and finally emerged to become King of the West Saxons and receive a regularly framed Saxon genealogy showing his descent from Woden through Cerdic, just what Alfred's was made out to be.

Alfred's splendid rally and victory at Wiltshire by no means relieved him of farther trouble with the Danes, but never again was he at their mercy. Until his death,—which occurred just about a thousand years ago, so that its millenary is to be celebrated at Winchester in October, 1901,—he went on steadily growing more and more capable of coping with them. He developed a well considered scheme of land-tactics, and also boldly coped with them on the sea, so that, in 897 A.D., four years before his death, he was sure enough of himself and of his power to treat a band of Danish pirates, captured off the Isle of Wight, as common malefactors. They were hanged at Winchester. His policy before this also bore fruit in the conversion of many Danes to Christianity. It is, in fact, abundantly evident that Alfred's tenacious resistance, coupled with his genuinely Christian policy, was the chief cause by which the heathen Danes first ceased to be a menace to the rising fabric of Christian civilization. If Charles Martel by his single victory at Tours rolled back the threatening flood of Mohammedanism and saved the beginnings of Western civilization the generation before Alfred, the danger from the north which came in Alfred's time was scarcely less serious, and that was first met by Alfred's stern resistance. His high resolve and unflagging persistence in England began that transformation of the heathen Danes, as the result of which they finally took their apportioned place in France, in Sicily, and in the Levant, as well as in Britain, and

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became at a critical period the standard-bearers of Christendom and the West against the East. How completely the fusion between the Old-English and the Danes was ultimately accomplished is proved by the fact that Knut, the great Danish successor to the power consolidated by Alfred and his son, and long wielded in England by their posterity, solemnly reënacted Alfred's laws more than a century after Alfred gave them.

In Alfred's laws one feature intimately concerns us Americans, because it foreshadows the mood of our earliest New England lawgivers. The same implicit belief in a direct government of all earthly commonwealths by God Almighty led John Eliot to take his Christian Commonwealth straight from Holy Writ, and prompted Alfred to open his laws with a translation into Old-English of the Ten Commandments, of various passages in Exodus, of parts of the Acts, and of the Golden Rule from St. Matthew's Gospel. But Alfred had the additional motive that there was in his day no Old-English version of Holy Writ, so that the biblical preamble to his laws supplied a very real requirement of his people. How real we may judge from William of Malmesbury's saying that Alfred "enacted his laws amidst the clash of arms, and while trumpets were sounding for the fray." Alfred's Saxons needed a strict reminder that they were Christians, in their desperate struggles against the Danes, and that Alfred's well-chosen extracts from Holy Writ supplied.

King Alfred, then, surnamed the Great in the days of our Puritan forefathers, is not the hazy and mythological personage which foolish laudation, and over-anxious carping are conspiring to make of him. He is the first historical figure in Old-English or Anglo-Saxon annals of whom we can form a clear picture, and with whose ideas, apart from several grotesque superstitions of his, such as the idea that Mt. Etna was hell-fire and that its flames had been moderated since the birth of Christ, we can sympathize. It will

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certainly be a healthy result of the present millenary revival of interest in the ideals of the Old-English, if we learn to prize and to heed the lessons contained in the life of one who, in a very real sense, was the father and founder of a great race, the first exemplar of virtues held in high esteem the world over; nowhere more than in England and America, whose political, social, and educational institutions still embody so much of Alfred's spirit.

But an interest attaching to our very institutions and rooted in our very national life and history can hardly be deep-rooted and durable, unless, as in the palmary case of the Sons and Daughters of the Revolution, it bears fruit in some tangible act. Let our interest have its upward growth, in Alfred's own words, "from the roots into the trunk, and then along the pith and the bark to the head, and thereupon through the boughs until it springs out in leaves and in blossoms and in fruits." There are two things to be done; one by all Americans, of whatever descent, and that is to read the most permanently valuable of Alfred's books, his translation of Boethius On the Consolations of Philosophy, now widely accessible in modern English. This book, though its popularity was greatest in the early Middle Ages, when English, Germans, French, Italians, and Jews vied with one another in explaining and translating it, and revered its authority as next to that of Aristotle, was translated by Chaucer about 1382 A.D. and printed by Caxton about 1480. Queen Elizabeth herself seems to have tried her hand at translating it, and Shakspere not infrequently seems to be almost quoting from it, so that its worth is proclaimed by all nations and many generations. The special merit and interest of Alfred's version springs from his simplicity of heart and fresh enthusiasm for Christianity, which make of it as rendered by him a new revelation of Eternal Truth and Righteousness. This is especially its effect in these latter days when we are jaded in mind by the prevalence of religious doubting and theological hair-splitting.

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The second thing which might be done by all Americans of Welsh, English, or Scotch extraction, would be to join hands with the English committee in celebrating the millenary of Alfred's death at Winchester, next October year, and contributing to the memorial there to be erected.

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IS THERE A PRIMORDIAL ATOM?*

By Percival Lewis.

From the early part of the present era until the beginning of the sixteenth century—during the age of alchemy—the belief in the possible transmutation of one element into another was generally held. The alchemists did not succeed in their attempts to transmute the baser metals into silver and gold, but their efforts served a nobler purpose in laying the foundations of the modern science of chemistry. The old alchemistic idea has, however, never completely died. Sir Isaac Newton and Sir Humphrey Davy did not consider it absurd. In the more general form, that all matter may possibly be constructed out of a common basis, it has been held by many eminent chemists and physicists down to the present day.

The ideas of the ancient philosophers as to the ultimate nature and structure of matter were so vague and purely speculative that they scarcely deserve consideration from the scientific standpoint. The atomistic hypothesis was first put on a sound basis in the early part of this century by John Dalton, who showed that it furnished the simplest explanation of the fact of chemical combination in multiple proportion. There seems to be no escape from the conclusion that in all chemical reactions simple indivisible units take part—but there is no necessity to assume that these

* Abstract of a lecture before the Science Association, September 12. 1900.

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bodies, which are, from the chemical standpoint, ultimate units, may not be capable of physical subdivision. A human being is the ultimate unit of society, but is nevertheless capable of physical subdivision. According to the hypothesis of Herbert Spencer, all material substances are resoluble into the so-called elementary substances composed of molecular particles of the same nature as themselves, but these molecular particles are complicated structures, consisting of congregations of truly elementary atoms, identical in nature, and differing only in position, arrangement, motion, etc., and the molecules or chemical atoms are produced from the true or physical atoms by processes of evolution, under conditions which chemistry has not yet been able to reproduce—neither can chemistry dissociate them.

It is difficult to conceive an atom so constituted as to fulfil all the necessary physical and chemical conditions imposed upon it. In Lord Kelvin's vortex-atom theory of matter we see an only partially successful attempt to construct all kinds of matter out of a common basis—the universal ether—and to account by purely mechanical considerations for all the properties of matter.

The earliest working hypothesis derived from the assumption of the unity of matter was that advanced by the English chemist Prout, in 1815. Observing that the atomic weights of the elements, as known in his time, were very nearly whole numbers as compared with the atomic weight of hydrogen, he assumed that the hydrogen atom is the ultimate unit out of which all other kinds of matter are constructed. More exact determinations of the atomic weights of the elements made by Berzelius and other chemists completely disproved this hypothesis, without proving, however, that chemical atoms may not be built up of some still smaller unit than the hydrogen atoms.

It was later discovered that we may group the elements in such a way that between the members of each group certain empirical relations of atomic weights and of chemical and

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physical properties exist, which strongly suggest a family relationship. For example, it was pointed out by Döbereiner, in 1829, that in the case of many elements which have physical and chemical resemblances the atomic weight of one is the arithmetic mean of that of two others. The atomic weight of sodium is 23, the arithmetic mean of 7 and 39, the atomic weights of lithium and potassium respectively. This rule holds good in a surprising number of cases.

A further advance was made later by Newlands, Lothar Meyer, and Mendelejeff, who pointed out that if the elements be arranged in the order of ascending atomic weights in rows of seven, each row under the preceding (with a few gaps to ensure similar elements coming under each other), all the elements in the vertical columns would exhibit similar properties. For example, all the alkali metals, lithium, sodium, potassium, rubidium, and caesium, fall in such a column. This periodic system (so called from the periodic recurrence of similar elements when arranged in the order of their atomic weights) has been fruitful of results. Several new elements suggested by gaps in the original table have been actually discovered, and it has also been useful in fixing the true atomic weights in cases where several possible values are found.

Such relationships are, with our present knowledge, purely empirical, and while they strongly suggest either a similar geometrical construction of the atoms in a related group (involving dynamical similarity), or a common basis, they have no obvious and complete physical explanation.

Similar empirical relations may be found by spectroscopic means. If light from an incandescent solid passes through a prism from a narrow slit and is focused by a lens, the different colors, or waves of different length, will be refracted differently by the prism, and a continuous spectrum will be formed, consisting of an infinite number of adjacent images of the slit, corresponding to the infinite number of colors in the light of the solid. Luminous gases or vapors,

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on the other hand, emit only a finite number of colors, and, therefore, give a discontinuous spectrum, consisting of a finite number of separated images of the slit in different colors. Each element has its own characteristic spectral lines, the positions of which are not duplicated by those of any other element. We assume that the vibrating molecules of the solid are so near as to interfere with each other's free vibrations, and cause a confused optical "jangle" of all vibration frequencies, which they communicate to the surrounding ether. A compound, when not heated beyond the dissociation point, gives a complex banded spectrum, which we associate with the idea of a complex molecule, while the elementary gas or vapor, the molecules or atoms of which are sufficiently far apart not to interfere with each other's free vibrations, gives a simple line spectrum, which we attribute to the atomic state—for we may assume that at very high temperatures many molecules of a gas may be dissociated into their constituent chemical atoms. Each line must correspond to an atomic vibration of a given frequency, and if a single iron atom can give something like ten thousand spectral lines it means that it is capable of that many kinds of free vibration, and must, therefore, be very complex in structure. Imagine the complexity of a musical instrument which can give ten thousand distinct notes—a piano of ten thousand strings! Is it not more reasonable to assume that there may be many degrees of atomic subdivision, each accounting for a single group of a few lines in a given spectrum? The possibility of such subdivision is strongly indicated in the case of mercury, for example. Chemically, the vapor of mercury is monatomic. When made luminous by the ordinary electric discharge it gives a simple line spectrum, as we might expect; but when a very powerful electric discharge passes through it a highly complex spectrum, consisting of thousands of lines, is observed. As in the case of iron, an enormous complexity of atomic structure must be assumed to account for so many modes of vibration in a single body.

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That groups of lines exist corresponding to various degrees of atomic complexity, each group due to a particular aggregation of elementary units, is indicated by the spectra of many elements, in which, as shown by Balmer, Kayser and Runge, and others, certain groups or series of lines are found, in each of which the lines are physically similar, that is, are sharp or diffuse, or vary in appearance in the same way with changes in temperature or pressure. Furthermore, the lines in a given group have a definite empirical mathematical relation between their wave-lengths, which does not exist between the members of different groups. Such considerations give great weight to the probability of atomic dissociation under the influence of high temperatures or powerful electric discharges.

It is found also that the spectra of the elements in a given periodic group frequently contain corresponding groups with similar appearance, but displaced in position toward the red end of the spectrum (the region of slower vibrations) with increasing atomic weight. This strengthens the idea of relationship implied by the periodic law.

Lockyer first stated the idea of dissociation into atoms of lower order, which he based largely on the occurrence of "basic" or apparently common lines on the spectra of different elements. It has been proved, however, by the use of more powerful spectroscopes, that the supposed coincidences which suggested the hypothesis of basic lines were illusory.

The facts so far described are significant as indicating some relationship between the elements and a possible atomic dissociation. We may gain some further insight into the matter by considering the relations of matter to electricity.

There is strong evidence that in acidulated water or a solution of any metallic salt in water a certain proportion of the chemical molecules are always dissociated into their constituent atoms or compound radicals, each of which is charged with positive or negative electricity. Such charged

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atoms or radicals are called ions. When an electric current is passed through such a solution, the electric forces cause the positively-charged ions to pass to the negative electrode, or cathode, the negatively-charged ions to the positive electrode, or anode, at which the ions give up their charges and recombine into chemical molecules. In this way the ions act as the carriers of the electricity through the solution. Faraday found that in a given time a given current will set free quantities of different substances which are proportional to the combining weights of these substances with hydrogen; or, in general, quantities which contain the same number of atoms. It follows that each ion, whatever its substance, transports the same quantity, e, of electricity. In general we have no exact means of determining the value of either e, the ionic charge, or m, the ionic mass (although a rough means of doing this will be referred to later), but it is evident that we may determine very exactly the ratio e/m, which is the same as E/M, where E is the total amount of electricity required to electrolyze M grams of the substance. In the case of electrolyzed hydrogen the value of e/m is about 10^4. The quantity e is the same for all substances, and seems to be a fundamental and indivisible unit of electricity.

The transfer of electricity through a rarefied gas is apparently somewhat similar to that through a solution. At ordinary pressures the electric spark passes with difficulty, and in a violent disruptive way. If the pressure in a vacuum tube be reduced by an air pump to several centimeters of mercury, the discharge passes quietly, and a general glow is diffused through the tube. The appearance of the discharge at the two electrodes is somewhat different, but there is little evidence of any electrolytic separation in the case of a compound gas, such as carbon dioxide. The current seems, however, to be transported convectively by ions.

When the pressure in a vacuum tube is excessively small —say the millionth of an atmosphere—the appearance of

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the discharge is entirely changed. It is, in fact, scarcely visible, but the glass walls of the tube are caused to fluoresce brilliantly with a green glow, especially in the regions opposite the cathode. It has been conclusively shown that this fluorescence is due to the impact of material particles projected from the cathode, or from the gas in its vicinity, with considerable mechanical force, as shown by the rotation of a vane placed in the path of the discharge. If these particles fall upon an insulated body it becomes charged with negative electricity, showing that the particles are themselves so charged. It was shown some years ago by Rowland that a statically-charged body moving with great speed behaves as an electric current. The conductor carrying the latter is, by reason of its magnetic field, acted upon by a magnet. We find, as we might expect, that the "cathode rays" are deflected by a magnet brought near the tube. This deflection must be proportional to the magnetic force, and to the quantity of electricity on each particle, and inversely proportional to the mass of each particle. We cannot determine either the charge or the mass separately, but if we measure the magnetic force and the deflection produced by it we can calculate the ratio e/m quite accurately. This has been done by Schuster, Lenard, J. J. Thomson, Kaufmann, and others, who have found consistent values ranging between the narrow limits, 3.6×10^6, and 17×10^6, and averaging about 7×10^6. This ratio is, then, something like one thousand times greater than the ratio e/m found in the electrolysis of hydrogen. The same values are found whatever the nature of the cathode or of the gas contained in the tube.

There are probably positively-charged particles projected from the anode as well, but their magnetic deflection is almost inappreciable, and they move with much less speed than the negatively-charged bodies. For them the ratio e/m varies with the nature of the electrode and of the gas in the tube, and is of the same value as in the case of electrolysis. We might infer from this that the negatively

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charged particles are much lighter than those charged positively, and that the difference in the values of e/m in the two cases arises from the differences in m.

Some years ago Zeeman, of Amsterdam, discovered that if an incandescent vapor is placed in a magnetic field, the spectral lines of the vapor are generally separated into several polarized components, indicating changes in vibration-frequency due to the magnetic force. Lorentz has explained how this may be due to the action of the magnetic field on charged particles, and the direction of polarization indicates that the light is due to negatively charged ions alone. From the amount of separation of the components the ratio e/m may be calculated, and Zeeman found it to be about 10×10^6, very nearly the same value as in the case of cathode rays, while e/m in the case of the electrolytic hydrogen ion is only 10^4.

The laws of chemical combination seem to indicate that m, the atomic mass of an element, is invariable; the facts of electrolysis indicate that e, the ionic charge, is likewise a fundamental and indivisible unit. In the case of the cathode rays and the Zeeman effect, however, it is evident from the high value of e/m that either e is a thousand times greater or m a thousand times less than in the case of electrolytic ions.

J. J. Thomson has recently put this question to a crucial test. It is easy to measure the total amount of electricity conveyed by a large number of ions, and if we could count the number of ions we could determine the ionic charge. This was the problem which Thomson successfully solved. It is impracticable to collect and count the cathode particles in a vacuum tube, but Thomson reached the same end in a different way. If ultra-violet light is allowed to fall on an insulated polished metal plate charged with negative electricity, the metal rapidly loses its charge, which seems to be conveyed to neighboring bodies by small material particles which are torn from the metal or the adjacent gas by the rapid vibrations of ultra-violet

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light, and repelled by the electric force. Positive electricity is not so discharged. From the deflection of these particles by a magnetic field in a rarefied space Thomson found, as in the case of the cathode rays, that the value of e/m was 7.3×10^6.

An ingenious method was adopted to count the number of the ions which discharged a negatively-charged plate. If a closed space saturated with water vapor be suddenly cooled, which can be accomplished by allowing the air with which the vapor is mixed to expand, the tendency of the vapor is to condense partially, provided some material nuclei, such as dust particles, be present. If such particles are not present, the vapor condenses with difficulty. It is found that charged ions also act as nuclei of condensation. Thomson placed some water in a closed vessel containing an insulated polished aluminium plate, charged with negative electricity. The cooling of the water vapor due to sudden expansion was not followed by condensation, showing that none of the requisite nuclei were present. Ultra-violet light was then allowed to fall on the plate. The latter lost its charge, and subsequent cooling of the water vapor was followed by the production of a cloud which slowly settled in the tube. From the rate of fall it was easy to calculate the size of the drops. Dividing the total volume of water condensed by the size of each drop, the number of drops, and hence the number of nuclei or ions, could be obtained. Knowing the total quantity of electricity discharged by all the ions, the value of the charge on each ion could be determined. In a similar manner Townsend, working with Thomson, had previously determined the charge e on each ion of freshly electrolyzed hydrogen. Thomson found that these two values of e were practically the same; hence the mass m in the cathode rays and in the discharge of negatively-electrified metallic plates must be less than the one-thousandth part of the mass of a hydrogen atom, in order that the ratio e/m may be more than a thousand times greater in one case than in the other.

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These charged ions may be either metallic particles detached from the metals forming the cathode or the plate, or gaseous ions resulting from the dissociation of the surrounding atmosphere. In any case the mass m seems to be independent of the nature of the metal or the gas, and Thomson considers that we have here a state in which subdivision is carried much further than in the ordinary gaseous state, and one in which all kinds of matter are reduced to the same primordial condition. This is in agreement with the hypothesis of a fourth or "radiant" state of matter advanced by Crookes when he first began to study the phenomena in vacuum tubes at very low pressures.

Without going into any philosophical discussion as to the ultimate nature of matter, we may say that experimental facts indicate very strongly that the so-called elements may be compounds or aggregates of some more elementary units, which may themselves be complex. We may sum up this evidence by saying that the periodic law indicates some family relationships among the elements which may depend upon either a similar atomic form or a common material basis. These relationships are substantiated by similar relationships between the spectra of the elements in a given periodic group. As evidence of the complexity of the chemical atom, we find that the spectra of some elements which are supposed to be monatomic become entirely changed and more complex under conditions which would promote dissociation. Furthermore, in the spectra of many elements there are series or groups of lines which are physically similar and which have wave-lengths connected by mathematical relations, indicating groups of different degrees of complexity. In the case of cathode rays and the discharge of negative electricity by ultra-violet light, we find that the ratio e/m is more than the thousand times greater than in the case of the ions of electrolysis, while the value of e appears to be the same in the two cases; consequently, there seems to be strong evidence that the masses concerned are less than the thousandth part of the mass of

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the hydrogen atom, the smallest body previously known to us. It is to be noted that these small corpuscles are found associated with negative electric charges only, as for a positive charge the ratio e/m always has its normal electrolytic value. This is a very significant fact, which may greatly modify our electrical theories.

We are justified, then, in concluding that there is some evidence for the existence of a primordial atom, or at least of atoms more elementary than those which take part in chemical reactions, and we have reason to hope that in the course of time we may acquire as definite information on this point as we have to justify our views regarding the chemical atom and the kinetic theory of gases.

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THE POWER AND METHODS OF HEREDITY.*

By Wm. E. Ritter.

I.

Heredity "is the biological law by which living beings tend to repeat their characteristics in their descendants." This definition is taken from Webster's Dictionary, and it is very good.

A statement about it that will serve the purposes of these articles somewhat better, however, than this definition, and that at the same time could not be objected to by rigid science, is as follows: Heredity is that in the nature of organisms by virtue of which they tend to reproduce their kind, and by virtue of which, also, they are never produced, either as wholes or in part, in any other way than by their kind.

Less than thirty years ago this would not have expressed the general teachings of biology on this subject.

That living things bring forth after their kind must have been one of the first phenomena to press itself upon dawning human intelligence. That, however, this is the expression of a universal law: that they bring forth absolutely nothing but their kind, and that they come forth in absolutely no other way than from their kind,—the finding out of all this has remained to be recorded as one of the triumphs of late nineteenth century biology.

Spontaneous generation, or archebiosis, and heterogenesis, or xenogenesis, are the terms that have generally

*A modification of a paper read before the Berkeley Club, of Oakland, September 27, 1900.

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been used to express the supposed limitations to the law of heredity; the former applying, of course, to generation without parents; the latter to generation by the transformation of organisms into others of different kind. Both have prevailed, not only in popular belief, but in scientific teaching down to very recent times. In fact, they are not wholly dislodged from popular belief even yet. In the pine forest regions of northern Wisconsin, dense thickets of poplars, miles in extent, spring up where the pine has been destroyed by ax and fire. Twenty years ago inhabitants of those regions assured me with the greatest confidence that the poplars "grew spontaneously." "How else could they originate?" asked an intelligent mill-owner; "Nobody knows of any poplar trees in this portion of the state from which seeds could come."

And it was the general belief with the farmers of the same state among whom I lived that wheat, particularly winter wheat, turns into "chees."

In fact, one still hears the question, usually in rather skeptical tones to be sure, but still the question, as to whether it is really true that horse-hairs turn into worms! But the errors of science regarding these matters are more remarkable than those of popular belief.

Until near the middle of the seventeenth century no man of science appears to have ever doubted that animals of various grades might get into existence by a variety of ways; as eels and other fishes from slimy mud, insects from the vernal dew of plants, grubs from fruit in which they live, etc. About this time William Harvey, whose fame ought to rest almost as much here as on his discovery of the circulation of the blood, published his "Discourse on the Generation of Animals," wherein is enunciated his classic aphorism "Omne vivum ex ovo."

It is doubtful, however, if Harvey really intended entirely to deny spontaneous generation. Various passages in his treatise indicate that he used the word Ovum in a general sense, as meaning the "living principle," or

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"primordium," which might arise "sponte et casu." Certain it is that he could not have meant by egg what we now mean by it, for the simple reason that the egg as we know it was wholly beyond the reach of the means of investigation at his command.

Indeed, some critics of Harvey's work have reached the conclusion that in reality he did not go much beyond Aristotle in his teachings on this subject. "Let us, therefore, say," he writes, "that that which is called primordium among things arising spontaneously, and seeds among plants, is an egg among oviparous animals." His essay abounds in the "vital spirits," "ingenerate heat," "generative contagion," "immaterial form," etc. that played so large a part in the speculative physiology of that period.

To Francis Redi, a Florentine physician, science owes the first genuinely sound, forward movement in this field. His is the glory of having substituted an experiment for speculation to find out how maggots occur in decaying meat. He put aside philosophizing for a little, and prevented the flies from "blowing" the meat. Having carried on this course of investigation for some time, he reached the conclusion that not only in this but in all like cases, animals are produced by parents. Quite in the true scientific spirit he did not, however, venture to go to the full extent of altogether denying spontaneous generation on the strength of his observations. He merely concluded that all life must come from already existing *living* things. He denied archebiosis, not, however, heterogenesis. He still believed that apple-worms, for example, are generated by the apples which they infest.

Redi's work caused much discussion, although little advance beyond his position was made for another hundred years. Then came that wonderfully acute experimental biologist, the Abbé Spallanzani, Professor of Natural History in the University of Pavia, who may fairly be said to have opened up modern investigation in this domain. (About 1750.) He made various infusions, subjected them

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to high degrees of heat, sealed them while hot in glass flasks, and found that under such circumstances the usual organisms no longer appeared in them. And from his experiments he drew the conclusion that germs floating in the air are the source of the animalculæ that ordinarily appear in such infusions.

With this work the conflict which has raged until now, almost, began. It is of course impossible even to outline the history of it all here. It will be sufficient evidence of the difficulty of the subject to mention that through all the last half of the eighteenth and the first half of the nineteenth centuries the most distinguished physiologists and naturalists are arrayed about equally on opposite sides of it. If anything, the predominance of authority verges toward the affirmative. We find here, for example, such names as that of Johannes Müller, the founder of modern physiology; Lamarck, whose "Philosophie Zoölogique," though published fifty years before the "Origin of Species" by Darwin, is at the present moment neck-and-neck with it in the race for favor among speculative biologists.

Belief in "archebiosis" and "xenogenesis" received about its last strong defence in "The Beginnings of Life," a work in two liberal-sized volumes written by Dr. H. Carlton Bastian, a Professor in University College, London, and a Fellow of the Royal College of Physicians and of the Royal Society of London. This was published in 1872, fifteen years after the appearance of Herbert Spencer's earliest essays on Evolution; thirteen years after that of the "Origin of Species;" and following by from one to fifteen years some of the most important works of Pasteur on fermentation and germ diseases. And of course Dr. Bastian was familiar with all these works. Indeed it was, as the author himself tells us, largely in response to the apparent demands of the doctrines of the Conservation of Energy and Organic Evolution that his investigations were undertaken.

After reviewing the work of Spallanzani, Ehrenberg, Pasteur, and others, who, on both experimental and

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theoretical grounds had rejected the doctrine of "archebiosis," Bastian declares: "The experimental evidence which I have brought forward not only goes to prove that living matter may originate in this natural manner, but that, like other kinds of matter, it comes into being by virtue of the operation of the same laws and molecular properties as suffice to regulate its growth."

And regarding Heterogenetic Transformations, he affirms "that both among the lower living things and in portions of higher ones these have been almost as well attested as the occurrence of allotropic and isomeric modifications amongst different kinds of not-living matter."

The second volume of the work is devoted chiefly to the author's own investigations—the methods employed, his observations, and his deductions. He worked much, as his predecessors and contemporaries had done, with various vegetable infusions; and he describes and figures in great detail the formation of the "primordial mucus;" then the differentiation of this into "embryonal areas;" and finally the gradual production in those embryonal areas of many kinds of monads, amoebæ, fungi, etc.

Cases of heterogenesis he details even more numerously and fully, if anything, than those of archebiosis.

Euglena, the "red-eyed animalcule," for example, he finds may transform itself into any one of the following animals: vorticella, rotifer, tardigrade, nematode. The euglenæ, in turn, arise from various algi filaments. So it comes about, this being interpreted in more familiar terms, that from a single low plant there may arise by direct transformation, five different animals, representing four of the chief subdivisions of the animal kingdom. And this on the authority of a learned professor of biology still living!

The doctrines of biogenesis and homogenesis have finally completely triumphed through the rigid application and the perfection of the methods introduced by Spallanzani one hundred and fifty years ago. The names of Pasteur, Tyndall, and many others, have become familiar in this

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connection. But particularly has the employment of these methods in the arts and sciences, as in the preservation of fruits, in antiseptic surgery, and in a hundred other phases of bacteriological practice, brought the great truth home, both to science and popular intelligence. Every housekeeper now knows that if her fruit has been heated hot enough and is sealed absolutely air-tight no fermentation will take place in it; and everyone knows that suppuration never occurs in wounds from which germs have been wholly excluded.

So far, then, as concerns the coming into existence of individual organisms, present day science holds the law of heredity to be universal. Living things reproduce nothing but *their kind*, and are produced in no other way than by *their kind*. But,—an organism may be of the *kind* of another and still not be exactly like it. Indeed, no two organisms, not even parent and child, are ever exactly alike. They always differ in some measure. Furthermore, no organism is precisely the same thing at any two instances in its own individual life. Change and variableness are likewise universal in the living world.

The grand total of our results is, then, that organic nature is under the dominion of two universal laws that oppose each other. So it is. On the one hand, there is ceaseless change; there is unlimited variableness. This is the very quintessence of the phenomenon we call life. The primordial organic substance, the protoplasm, is alive just in virtue of the fact of its chemico-physical instability. Its highly but loosely organized chemical compounds are ceaselessly breaking down and setting free their stored-up energy, and are as ceaselessly building themselves up again. Change, I repeat, is the very quintessence of life. And living beings, however complicated and exalted in rank they may be, never escape the qualities stamped upon them by the primal stuff of which they are composed. This is the *dynamic* side of the living world. On the other hand, there is the universal tendency to fixedness. There

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is, through extraneous physical conditions, as nutrient material, moisture, temperature, other impinging bodies, etc., mass-limitation to this ceaseless play of force on the dynamic side. In other words, this play is restricted to *bodies*, to *forms*. But *form* is wholly inert. It is a clog upon activity, as one might say. Here we have the *static* side of the living world. This is heredity. The law of heredity is therefore a law of passivity. The force of heredity is a negative force, if indeed it may be called a force at all. What in reality we mean by the force of heredity is the persistence of the type-form that has been engendered by the limitation to the play of forces on the dynamic side of life, through the sum total of conditions under which life exists. It is very important to remember this. There is no biological warrant for the supposition of a real force the business of which is to shape organisms into specific forms. It is undoubtedly true that many expressions may be found in recent writings by good authorities that seem to imply such a force. But they either do not convey the writers' exact meaning, or they arise from misconceptions. The only forces inherent in organisms are those concerned in the metabolic processes of protoplasm; and these have no form-producing capabilities in themselves whatever. They are the same in all creatures however diverse in form. The creature in itself merely grows and varies and acts. The specific attributes that it has are the result of the extraneous conditions which it and its ancestors have grown and acted *against*.

Having now reached a clear conception of the fundamental nature of heredity, we are in position to consider its power and mode of operation.

As almost all the popular interest in heredity centers about the question of the transmissibility of so-called acquired characters, we may as well fix upon this as the focal point of our further discussion. And in the first place we must define some terms. All the parts and attributes of an organism are characters. These are of many

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grades. Man, for example, has his individual characters, or those which distinguish him from all other individual men; his specific characters, or those which he possesses in common with all other individuals of his species, but which are possessed by no other species whatever; his generic characters, or those which make him belong to the genus *Homo;* his class characters, as his mammary glands, his hairy body, his single aortic arch turning to the left, etc., which mark him as a member of the class mammalia; and so on. If we locate him definitely in the zoölogical scale we shall have to make use of all his parts and attributes; *i.e.*, all his characters. I have dwelt upon this because most persons do not, apparently, think of the matter in this broad way, particularly when questions of heredity are being discussed.

Now the mere statement of the fact that man has been evolved from some creature vastly simpler than he is, is equivalent to saying that his characters have all been *acquired* in some way and at some time. In the course of his individual development, beginning with the simple egg, he takes on one by one, or acquires, all his characters; and likewise in his racial development, or phylogeny as we say, they have all been taken on one after another. He has no characters that are not acquired. Obviously, therefore, the question is not in reality whether acquired characters are transmissible, but rather whether characters acquired in some particular way and at some particular time are transmissible.

It is advantageous to observe that all the characters of an organism may be placed in two great categories, *viz.*, those which come from its ancestors, and those which do not; those which are in the nature of the organism, and those which come from the exterior. The first kind are in the blood, so to speak, while the second kind are imposed upon the being wholly from without, and consequently pertain to its own individual life-time alone.

The first we may call ancestral characters; the second,

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extra-ancestral. To the first belong, of course, the vast majority—probably nine hundred and ninety-nine thousandths—of all the characters. All class, ordinal, generic, specific, and most of the individual characters belong here. To the second belong the few, say the remaining one thousandth; and these are all individual.

Now it is this second small group of characters that the term acquired, as ordinarily used, relates to. And it is with reference to these alone that there is question about transmissibility. No one with any authority to speak on the subject at all has ever for a moment either thought of so limiting the definition of heredity that it should not apply to the first group, or doubted that all the characters belonging to this group are transmissible. It is difficult to understand how so many educated persons have become confused on this point, and I should not have believed such a thing possible. The frequency, however, with which I am asked if I "believe in heredity," or whether I "believe in heredity, or environment" indicates that the misconception is widespread.

The terms which we use having now been defined, we may see what we can make out of the question of the transmissibility of acquired characters.

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MRS. JANE KROM SATHER'S GIFTS TO THE UNIVERSITY OF CALIFORNIA.

At a meeting of the Regents on October 8, 1900, the President announced the gift to the University, by Mrs. Jane Krom Sather, of money, stocks, and real property of the value of nearly $100,000, for the endowment of a Jane K. Sather Chair and the establishment of a Jane K. Sather Law and Library Fund. Regent W. H. L. Barnes expressed on behalf of the Regents the deep appreciation of Mrs. Sather's munificence felt by all the members of the University, and by every friend of education. Resolutions accepting the gift and thanking Mrs. Sather were adopted as follows:

"WHEREAS, Jane K. Sather has offered certain gifts to this corporation for certain purposes and trusts, and upon certain conditions, by a written communication in the following language:

SAN FRANCISCO, CAL., October 8, 1900.

To the Regents of the University of California,

GENTLEMEN:—As a resident of the State of California, and one who is deeply interested in its welfare, I am desirous of encouraging and assisting the work of liberal education which is now being carried on by the University of California. For this purpose I offer you the following property:

Cash	$28,000 00
Two hundred shares of the stock of the San Francisco National Bank, of the value of	20,000 00
One hundred shares of the stock of the Fireman's Fund Insurance Company, of the value of	21,000 00
Real estate in the town of Ashland, Oregon, of the value of	6,000 00
	$75,000 00

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This property I offer you as a corporate body, upon the following conditions and for the following purposes:

That it, or its proceeds, be held by you as a separate and perpetual fund, the income whereof shall be paid to me quarterly during my life, and after my death shall be devoted by you to the perpetual support, maintenance, and equipment of such chair in a department of classical literature at the University of California as you in your discretion see fit to establish for this purpose; such chair to be known as the Jane K. Sather Chair, and such fund as the Jane K. Sather Chair Fund. You are to have full and unrestricted rights of control, disposition, and ownership of the property constituting such fund, having in mind always the purpose of maintaining a perpetual fund properly invested so as to yield an income for the purposes heretofore mentioned.

I also offer you the following real property in this State:

First: The premises in the City of Oakland forming the northwest corner of Jefferson and Ninth Streets, with a frontage of seventy-five feet on Ninth Street and one hundred feet on Jefferson Street.

Second: The premises in the City of Oakland on the west side of Broadway, thirty-four feet north of Delger Street, with a frontage of thirty-three feet and a depth of one hundred and thirteen feet, six inches.

Third: The premises in the City of Oakland on the westerly side of Broadway Street, one hundred feet north of Delger Street, with a frontage of fifty feet and a depth of one hundred feet.

Fourth: The premises in the City of Alameda on the easterly side of Park Street, fifty feet south of Webb Avenue, with a frontage of fifty feet and a depth of approximately one hundred feet.

This property I offer to you as a corporate body upon the following terms and conditions:

That you have the full and unrestricted rights of control, disposition, and ownership of this property, or the proceeds of it, but that during my life you are to hold it, or the proceeds of it, as a separate fund, and keep the same invested according to your discretion so as to yield as large and steady an income as is possible consistently with safe investment, and pay the income to me quarterly. After my death, so much of said property, or the proceeds of it, as amounts in your judgment to the sum of Ten Thousand Dollars ($10,000) shall be by you set aside and held as a separate and perpetual fund to be known as the Jane K. Sather Law and Library Fund, the income whereof shall be devoted by you to the perpetual support of a law library at the University of California by way of the purchase of law books and publications.

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In case any of said property, or the proceeds thereof, remains after setting aside therefrom the fund just mentioned, such remainder shall, up to the amount of Ten Thousand Dollars ($10,000) be expended by you in the purchase of law books and publications for the purpose of establishing, adding to, or maintaining a law library at the University of California. The times and occasions for expending this sum, or any portion or portions of it, shall be entirely within your discretion; and waiting the proper time and occasion for such expenditures you shall have the right to invest and accumulate the said sum, or the property representing it. Each book or publication purchased with those gifts, or the proceeds thereof, shall be plainly stamped with a suitable device expressing that the same has been purchased with funds donated by me to the University of California.

In case any of said property, or the proceeds thereof, remains after setting aside the two foregoing sums of Ten Thousand Dollars ($10,000) each, then such remainder shall be devoted by you in such manner and at such times as you deem best to the advancement and support of the teaching of law at the University of California, in which case I ask you to take such means of permanently acknowledging this gift as you may deem advisable.

Upon receiving word from you of your acceptance of these gifts upon the conditions and for the purposes set forth, I will deliver to such officers as you may designate to receive the same and give a receipt therefor in your name and on your behalf, proper instruments of transfer to you of the property specified.

With the sincere and deep hope that these gifts may be a source of great good to the University, and through it to the State, I remain,

Yours very respectfully,

JANE K. SATHER.

"AND WHEREAS, It is deemed for the best interests of the University to accept this very generous offer,

"*Now therefore, be it resolved:* That said offer be and is hereby accepted by this corporation and that the property offered be taken, received, held, managed, and invested, and the proceeds thereof used, bestowed, and applied by this corporation for the purposes and trusts and upon the conditions prescribed in said communication, and that the President of the University and the Secretary of this corporation be authorized in its behalf to receive the property so offered and the instruments of transfer and evidences thereof, and to give a receipt therefor in the name of this

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corporation and under its seal specifying that the said property is accepted by this corporation upon the conditions and for the purposes and trusts specified in the said communication.

"*Be it further resolved:* That the President of the University and the Secretary of this corporation be directed and authorized to transmit to Mrs. Sather a communication in the behalf of this corporation and under its seal, informing her of the acceptance of her offer and embodying these resolutions."

A gift of $10,000 by Mrs. Sather for the establishment of the Jane K. Sather Library fund was made public in the following letter:

OAKLAND, Cal., October 27, 1900.

Benjamin Ide Wheeler,
President University of California,

MY DEAR SIR:—I give and deliver to you as representative of the University of California the following duly endorsed promissory notes of F. M. Smith:

$5,000.00. October 10th, 1896, interest at 6% per annum,
$5,000.00. October 13th, 1896, interest at 6% per annum,

with collateral, Certificates Nos. 441 and 442 for one hundred shares each of the Pacific Coast Borax Co.

This gift is for the establishment of a fund, the income of which is to be used for the purchase of books for the Library of the University of California. The gift of these two notes is absolute and I shall hope to receive a formal acknowledgement of this gift from the Regents of the University whenever it shall be convenient.

Yours very sincerely,
JANE K. SATHER.

At the University Meeting on Friday, November 9, the President announced Mrs. Sather's third rich gift to the University. He said that she had executed a deed conveying to him in trust real property in Oakland which upon her death is to be sold and the proceeds applied in accordance with instructions contained in a sealed letter now deposited in escrow in an Oakland bank. The method of administration of the trust is not yet known, but it is understood that Mrs. Sather's last gift is a most generous addition to the beneficences which she has hitherto bestowed upon the University.

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OFFICIAL ACTION.

At a meeting of the Regents held October 9, in accordance with the recommendations of the President, Dr. H. L. Ryfkogel was appointed Professor of Pathology and Applied Microscopy in the Post-Graduate Medical Department, Dr. R. Beverly Cole was appointed Emeritus Professor of Obstetrics and Gynecology in the Medical Department, and Dr. Beverly MacMonagle was appointed Lecturer on Gynecology in the Medical Department.

At a meeting of the Graduate Council held September 28 the Secretary announced that the President had appointed the following committee on the Association of American Universities: Professors Leuschner, Clapp, Hilgard, Stringham, and Howison.

At a meeting of the Graduate Council held September 28 the Secretary read the following report:

The Committee of the Graduate Council on the Library recommends the adoption of the following rule subject to the approval of the Board of Regents:

Persons resident in Berkeley, who may desire to pursue courses of reading or study without becoming members of the University, may have full student privileges in the Library, provided each application for such privileges be endorsed by two members of the Academic Senate, and be accompanied by a deposit of ten dollars in the office of the Secretary of the University. In each case such deposit, less charges for damage and loss of books and fines for violation of rules, shall be returned to the depositor, when he no longer desires to use the Library. Such privileges shall lapse on the 30th day of June of each year, but may be renewed on application to the Librarian.

For the Committee,
THOS. R. BACON.

This was adopted without dissent, and the action of the

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Graduate Council was communicated to the Regents by the President at the meeting of October 9. On his recommendation the matter was referred to the Committee on Library and Museum with power.

The following committees of the Academic Council have been announced for the academic year 1900–1901:

1. Military Department and Gymnasium: Professors Waite, Edwards, Magee; 2. Regulations: Professors Stringham, Hilgard, Slate, Merrill, Hengstler; 3. Examination of Schools: Professors Slate, Brown, Bradley, Merrill, Babcock, Setchell, Stringham, Paget, Kower; 4. Recommendations for Teachers' Certificates: Professors Brown, Lewis, Richardson; 5. Scholarships: Professors Wickson, Brown, Senger, Stratton, Sanford; 6. Frank J. Walton Memorial Loan Fund: President Wheeler, Professors Bacon, Bradley, [to serve until 1903–1904]; 7. Schedule of Exercises: Professors Haskell, Leuschner, Page; 8. Applications for Admission: Professors Senger, Cory, Armes; 9. Credentials: Professors Merrill, Cory, Haskell; 10. Study-Lists: Professors Richardson, Merriam, Babcock, Raymond, Whitney; 11. Special Students: Professors Bradley, Christy, Putzker, Loughridge, O'Neill; 12. Students' Affairs: Professors Bacon, Ritter, Edwards; 13. Athletics: Professors Edwards, Bacon, Clapp, Mr. Hunt; 14. Course Preparatory for Medicine: Professors Ritter, O'Neill, D'Ancona, Jepson, Dr. Bancroft; 15. Commencement Exercises: Professors Soulé, Setchell, O'Neill, Magee, Mr. Maybeck; 16. Classification: Letters, Social Sciences, Natural Sciences, and Commerce: Professors Gayley, Slate, Clapp.

At a meeting of the Academic Council held September 14, Professor Merrill, on behalf of the Committee on University Colors and University Flag, reported that, after conference with the President of the University, blue and gold had been selected as the University colors, and that ribbons showing the proper shade had been deposited at the Coöperative store.

At a meeting of the Academic Council held September 14 the Committee on Scholarships reported recommending the appointment of the following to fill vacancies caused by resignations: Elizabeth Smith Wetmore, State of California Scholar, Second Congressional District; Mary E. A.

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Gray, State of California Scholar, Fourth Congressional District; Minna H. Nelson, Levi Strauss Scholar, Sixth Congressional District.

At a meeting of the Academic Council held November 16 Oney McCutchan Nicely was appointed a Levi Strauss Scholar from the Sixth Congressional District to fill a vacancy caused by resignation.

At a meeting of the Academic Council held November 19 the following resolution was adopted:

That it is the sense of the Academic Council that the curriculum of the College of Commerce be laid out on the model of the technical colleges rather than on the model of the colleges of general culture.

It was further voted that the President appoint a new special committee to arrange a curriculum for the College of Commerce with a view particularly to its proper relation to the other colleges of the University. The President appointed Professors Page, Gayley, Stringham, Leuschner, Cory, Ritter, and Slate.

At a meeting of the Academic Council held November 19 the following resolution was adopted:

Entrance examinations will be held in August and January of each year. The January examinations are primarily for the purpose of enabling students in the University to remove deficiencies incurred in the previous entrance examinations, but they may be taken by applicants not enrolled in the University who may present certificates from their teachers that they are prepared in the subjects they offer.

CURRENT NOTES.

As a result of his publications on dietetics and agricultural chemistry, Assistant Professor Jaffa has been appointed special agent and food expert in the Division of Chemistry of the United States Department of Agriculture.

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Before the Geometry section of the International Congress of Mathematics, held at Paris in August, Professor Stringham read a paper on Orthogonal Transformations in Elliptic or in Hyperbolic Space.

The Bénard plans for the University of California were on exhibition at the Paris Exposition and were awarded a gold medal. A plaster cast of Douglas Tilden's statue, The Football Players, the trophy won by the California teams of 1898 and 1899, received a similar honor. In the Department of Forestry and Fisheries an honorable mention was also awarded to Dr. Chas. A. Kofoid, recently appointed Assistant Professor of Histology and Embryology.

Professor F. W. Putnam of Harvard University, Curator of the Department of Anthropology of the American Museum of Natural History in New York, who is visiting Arizona, New Mexico, and California to make certain investigations connected with his work, on Wednesday, October 3, addressed the Science Association on "Some Problems of American Anthropology."

The Philological Association of the Pacific Coast, which was organized at a meeting held at the Mark Hopkins Institute last December and of which President Wheeler is President, has been accepted, on terms of close affiliation, as a branch of the American Philological Association. Hereafter the general association will receive all fees from the branch society, and in return will pay all local expenses of its meetings and print in the Transactions of the American Philological Association the most notable of the papers presented at its sessions. The membership of the Philological Association of the Pacific Coast includes most of the members of the philological faculties of the University of California and Stanford University, and a number of other California, Oregon, and Washington philologists. The next meeting will be held in San Francisco December 28 and 29.

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On September 1 about sixty alumni who had graduated as officers of the University Battalion, President Wheeler, Regent Denicke, twelve members of the Faculties, and Adjutant-General W. H. Seamans, N. G. C., were the guests of Colonel George W. Bauer, '97, at a dinner at the Spreckles Rotisserie in San Francisco. After the dinner the Alumni Commissioned Officers' Association of the University of California was organized, and a constitution adopted. This states the aims and purposes of the organization to be:

1st. To bring together in close social intercourse all those who during their college course have shown a taste for military science and tactics.

2d. To bring all officers commissioned from the University of California to a full realization of their duties and their privileges.

3d. To foster and promote the efficiency of the University Cadets by bringing together those who have proved themselves to be interested in the welfare of the Cadet Regiment.

The following were elected officers: Commander, Col. Geo. W. Bauer; Senior Vice-Commander, Col. H. W. Gibbons; Junior Vice-Commander, Col. J. R. Moulthrop; Adjutant, Capt. Wm. Jurgens. The roll was signed by fifty-five alumni officers, and President Wheeler, Regent Denicke, General Seamans, Capt. Winn, Capt. Cloman, and the members of the Faculties present were elected Honorary Members.

The list of intrants to the University, published September 1, showed 62 graduate admissions, as compared with 88 last year, and 654 undergraduate, as compared with 552 in 1899. The proportion of students from outside the state has risen from three per cent. in 1898 to eight per cent. in 1900. An interesting displacement of balance is found in the rapid growth of the Southern California contingent. In 1894–95 only one student in eleven came from the counties south of Tehachapi: the proportion has steadily risen until in the entering class one student in five comes from Southern California. On the other hand the proportional representation from the Bay cities of San Francisco,

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Oakland, Alameda, and Berkeley shows a steady decline from sixty-seven per cent. in 1894–95 to forty-one per cent. Alameda County, which had forty and eight-tenths per cent. of all the students two years ago, shows only twenty-five per cent. among the intrants.

These figures are most significant. Despite the rapid growth of the University as a whole, the representation from Southern California grows fifty per cent. more rapidly than the University; that from outside California, two hundred per cent. more rapidly; that from the immediate neighborhood — Oakland, Berkeley, and Alameda — falls beyond forty per cent. The University is evidently rapidly becoming a university for the whole state.

The report of the Committee on Admissions at the meeting of the Graduate Council on September 28 raised the number of those admitted as graduate students to 75, and that of the Committee reporting to the Academic Council November 16 showed that at that date there had been 670 undergraduate intrants.

The Catalogue of Officers and Students (to September 17, 1900) shows that there are in the Colleges at Berkeley 180 officers of instruction and administration, 117 graduate students, and 1885 undergraduates. Of the students of the University, 17 graduate and 220 undergraduate live in San Francisco; 17 graduate and 259 undergraduate in Oakland; 2 graduate and 47 undergraduate in Alameda; and 81 graduate and 1359 undergraduate in Berkeley. That Berkeley is more and more becoming a college town is shown by the fact that, whereas six years ago but 51 per cent. of the students resided there, in 1900 it is the college residence of 71.9 per cent. The lack of dormitories is to a certain extent supplied by the sixteen fraternities for men and five for women and the ten men's house clubs and two women's.

In accordance with the custom of having distinguished scholars from other universities deliver courses of lectures

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at Berkeley recently inaugurated with the lectures of Professor H. Morse Stephens of Cornell University, Professor Louis Dyer, a graduate of Harvard University who for many years has been a Fellow of and a tutor in Balliol College, Oxford, during the current month delivered at the University the following seven lectures on Mycenaean Greek Art: Introductory, The Cretan Alphabet, Dr. Schliemann's Excavations, Old Knossos and the Labyrinth of Minos, Mycenaean Gems, Lights on Homer, and Mycenaeans in Egypt. The lectures, which were illustrated by lantern-slides especially made for them, proved so popular that the largest lecture-room in the University was too small to accommodate the audiences and the Gymnasium had to be utilized for the purpose. Professor Dyer also delivered three other, unconnected lectures in Berkeley: Machiavelli and Modern Instances—an account of Machiavelli's maxims in connection with the events of the South African War, in the Gymnasium, at the Students' Hour on November 9; The Millenary Commemoration of King Alfred, an address to the members of the English Department, in the Gymnasium, on November 13; and Helen of Troy, a lecture under the auspices of the Art Association of the University of California, at Stiles Hall, on November 15. Professor Dyer also delivered two courses of University Extension lectures in San Francisco, one in the auditorium of the Academy of Sciences, on Machiavelli—1. "The Prince" and Caesar Borgia; 2. Machiavelli's Use of History; 3. Machiavelli's Idea of Morals—and the other in the auditorium of the Young Men's Christian Association, on Mycenaean Greek Art—1. Introductory; 2. Old Knossos and the Labyrinth of Minos.

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University Chronicle

VOL. III DECEMBER, 1900 No. 6

MACHIAVELLI AND MODERN INSTANCES —AN ACCOUNT OF MACHIAVELLI'S MAXIMS IN CONNECTION WITH EVENTS OF THE SOUTH AFRICAN WAR.*

By LOUIS DYER.

Bacon's and Raleigh's obvious perplexities regarding the Machiavellian state policy, which they advocated in common with most Englishmen of mark in their time, is surely quite genuine enough to make us certain that The Prince conveyed to them far more than the crude and prehistoric political doctrine that "the king can do no wrong." Read with light from the Discourses, the Prince will often appear to be a sort of pamphlet of the times, launched forth to gain the ear of the writer's contemporaries. To them the now long-accepted idea of nationality was vague and all but unknown, and they were unprepared as yet to allow any effective political *status* to the people. Strictly national feeling came as a surprise to many, as can be proved out of the mouth of Erasmus. While Machiavelli was writing The Prince, Erasmus was asking what sense there was in the ridiculous wars of his day between Christians. Why, he urged, should a paltry question of this king's title, that royal stripling's silly ambition, or another's

* An address at a University Meeting in the Harmon Gymnasium, Friday, November 9, 1900.

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personal pique, make Christians forget the many bonds uniting them? Why not arbitrate? There are no end of bishops, abbots, and learned men, of grave magistrates whose adjudication ought, in common decency, to settle such matters. What must the Turks say of our wars? "Nowadays," he goes on to say, "your Englishman hates a Frenchman just for being French, a Scotchman because he is Scotch hates an Englishman, and so an Italian hates a German, and a Swabian, a Swiss."* Such was Erasmus' unsympathetic appreciation of the new political force that has found its full expression in the modern theory of state policy inaugurated by Machiavelli in The Prince.

It is not, therefore, an accident which led Cardinal Pole to include in one and the same publication his *Apologia*, or open letter to the Emperor Charles V., first a denunciation of his cousin Henry VIII. of England for yielding to the temptation of the devil in divorcing Queen Catharine and cutting off the English Church from the See of Rome, and, finally, the most unmeasured abuse of Machiavelli's Prince. Thomas Cromwell pressed upon him the loan of a MS. copy of it when Pole met him at Wolsey's in the year 1628–29. But Pole was offended by this offer, and says that he only read the book years afterwards, when he became willing to brave the risk of its perusal because he felt that the book "betrayed the enemy's secrets," and "contained the plan of campaign drawn up by Satan for the damnation of mankind." In Pole's view the severance of England from Rome was an act of civil war on Henry's part, and Machiavelli's Prince, which made out that such a severance was good policy, was a treasonable assault on the body politic of the Church Universal and the Holy Roman Empire. Far more enlightened than Pole in many ways, Erasmus was afflicted by the same purblindness when he insisted that the ties binding Christians together as Christians were far more numerous and effective than those national ideals which sundered them. These last he simply ignored, and

* *Institutio Principis Christiani*, 1516.

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proceeded to beg the whole question at issue between the new order and the old disorder by proposing bishops and abbots as peacemakers. The real point at issue being whether ecclesiastical principalities should exist, he suggested referring the matter to the ecclesiastics.

The Prince, then, may be considered as, in some senses, a popular "broadside," written to gain a hearing for views which were more accurately and completely stated by Machiavelli in the Discourses on Livy and elsewhere. In our author's mind, the modern notion of the people as a nation involved several things not necessarily and ideally connected with it. First of all, it involved an unscrupulous and arbitrary over-lord, who should represent the people, speak for them, act for them, and be their defender against the anarchy which came, especially in Italy, with the political shipwreck of the Church and the Empire. This was the chief function of the prince, dreamt of by Machiavelli when he scrutinized Cæsar Borgia's atrocious career in the Romagnas and marked how it resulted in improving the condition of the Romagnol people.

There is certainly room for confusion of mind between the prince, on the one hand, whose treachery, bad faith, and brutal vulgarity are borrowed from the Italians of the Renaissance, whom he was primarily portrayed to represent, and the Roman people, the *popolo principe*, on the other hand, the "antique" efficiency of whose sovereign rule is lauded in the Discourses. That sovereign prince and this sovereign people belonged to different political worlds. Machiavelli is often, but not always, alive to this fact. He speaks of Italians, Spaniards, and French as the dry-rot *(corrutela)* of the world, and descants upon the "antique" life and virtues of contemporary Swiss and Germans. Also the unexpected vigor of England extorts from him an implied recantation* of his early and rather hasty declaration that Englishmen were fatally undisciplined.† And thus it

* Discourses, I, c. xxi.

† Rittratti delle cose di Francia.

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appears that, when he surveyed Europe as a whole, our author distinguished the Swiss, the Germans, and the English as offering in modern days the counterpart of that political and military efficiency which he called *virtù*, and chiefly discovered in the ancient Romans; for England, though it did not require exactly Machiavelli's Italian prince in order to achieve full national independence, still required the princes of the House of Tudor, whose many Machiavellian traits are notorious.* Nor did Machiavelli conceive that the sovereign people of Rome dispensed with a period of equally essential rule by princes equally absolute. He speaks repeatedly of the early political education of Rome by Romulus, Numa, and the other kings. Thus we may sum up our author's teaching by saying that he may be thought of as regarding the new-fledged nations of Europe in his day as *in statu pupillari*. Machiavelli substantially said to his own generation: 'Be what you are not yet, and do what you obviously cannot, and you shall be as the Imperial Romans were—free; remain as you are, and do what you must, and you shall be subjugated by the prince. His work once well done, your children's children shall witness the coming of age of a nation, and the absolute prince shall give place to the sovereign people.'

As for Machiavelli's mood in regard to religion, I think it might be summed up if we were to make him say in blunt terms: 'Governors and governments in our day have their work cut out for them in saving our skins, therefore in politics the less said about saving our souls the sooner mended.' The course of events in modern times, so far as the temporal power of prelates, popes, and ecclesiastics are concerned, has very fully explained why Erasmus' notion of ecclesiastical arbitration was impracticable, and the records of modern history constitute one long *pièce justificative* for the eleventh chapter of The Prince, where our author gives reasons for excluding ecclesiastical principalities from practical politics. "These are the only princes who are happy

*See in particular an essay by Mr. Owen Edwards, M.P.

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and secure," he there says. "They need no policy of state, for their subjects do not dream of expecting to be governed or in any way protected. No skill or effort is required of an ecclesiastical prince. When you have such a principality you've got it, and there's an end."

After all, efficiency is Machiavelli's final test for any and every form of state and frame of government. Apart from his obliquities of mind and limitations of vision, he divined the only real force that had not as yet been adequately utilized in the schemes of government propounded in his day. That force resided in the people, but, for the moment, in the people as represented by an absolute national prince. Every human institution needs, according to one of Machiavelli's soundest dicta, periodical renovation and consolidation by some sort of return or reversion to its primitive conditions, and this is true even of the spiritual government of the Church, which he declares would long before his time have made utter shipwreck had it not been for the movements inaugurated by St. Francis and St. Dominic, who preached poverty and the example of Christ, and thus neutralized the ruinous effects of evil living among prelates and at the Court of Rome.

"It is a simple matter," says Machiavelli,* "to divine the springs of that devotion with which a people aspires to liberty; for the facts of experience demonstrate that states have never either enlarged their boundaries or increased their wealth, except while they enjoyed liberty." If our author had ever read Herodotus, this might be supposed to come from the Father of History. At all events, it will seem to some a startling utterance to come from him who wrote The Prince. Possibly, if he were here, and we pointed out to him that without liberty Russia has vastly enlarged her dominions and increased her wealth, he might declare that Russia could not possibly be classed as a state. At all events, it is worth noting that in the Florentine Secretary's philosophy, as in so many others, the course of

* Discorsi, II, c. ii.

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Russian policy is a vast and baffling anomaly. There is, however, another cardinal saying of his which does apply to Russia. Russia is wonderfully ready in her own way to incorporate new citizens. It is one of the Machiavellian dicta of which Lord Bacon was especially fond, and may therefore stand here in Bacon's words. "All States," says Bacon (Of Kingdoms and Estates), "all States that are liberal of naturalization towards strangers are fit for empire; for to think that a handful of people can, with the greatest courage and policy in the world, embrace too large extent of dominion, it may hold for a time, but it will fail suddenly. The Spartans were a nice people in point of naturalization, whereby, while they kept their compass, they stood firm; but when they did spread and their boughs were become too great for their stem, they became a windfall upon the sudden. Never any State was, in this point, so open to receive strangers into their body as were the Romans; therefore it sorted with them accordingly, for they grew to the greatest monarchy." With a slight alteration in the date of its diction, this passage might have been incorporated in the preamble unanimously adopted not many months ago by the Canadian House of Commons, "representing a people which has largely succeeded by the adoption of the principle of conceding equal political rights to every portion of the population," in declaring its support of the Imperial Government in the present South African War.

Here, then, we can see that Machiavelli, in spite of his attachment to what was then the coming political force, the principle of nationalities, would have solved the present difficulty in the Transvaal by saying to the Boers:—If you cling to your independence you must abandon all ideas of a South African Union under your control, since your acts convict you of utter incapacity for enlarging your dominion or increasing your wealth in a sound and permanent manner. The fact that you will not and cannot extend the privileges of citizenship to those within your borders renders your pretentions to figure among the Great Powers as an "Independent International State" politically absurd.

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About a year since, Lord Rosebery compared the policy of the Boers in trekking off into the wilderness to that of the Mormons in withdrawing to far-off Utah, and the comparison holds good both in respect of the desire which these two otherwise very different communities had to isolate themselves from the common progress of the world, to "set back the clock," as his lordship phrased it, and also in respect of the "peculiar institutions"—polygamy in the case of the Mormons, together with certain very crude theological and ethical views; and in the case of the Boers equally narrow, though less crude, theological views, together with an ineradicable desire to "wallop their niggers" at their own discretion. A third point of analogy which showed itself in a practically identical form in Utah and in the Transvaal as soon as those retrograde communities had well established themselves, was in the problem of the Gentiles for Utah and of the Outlanders for the Transvaal. Both communities solved it in the same way, were guilty of the same violation of sound state policy, and we may therefore look confidently for the same issue in the case of the Boers which we have seen in the course of events in Utah. There are, however, in spite of these undeniable points of analogy, so many points of dissimilarity, that it might be felt there is serious unfairness to the Boers in working out in such detail as has here been done any such parallel between the Boers and the Mormons. The power of far-sighted military preparations, a certain chivalrous high-mindedness in actual war, a fine quality of patriotic self-devotion, and an admirable courage and skill in actual combat are all present in the Boers, and command a sort of admiration which would be ill-bestowed on any deeds of the Mormon saints.

Having thus by our comparison sinned against the Boers, let us restore the balance, and pay them the compliment of a comparison with better men than they. Their cause has several obvious points of analogy with the "lost cause" of the Southern Confederacy in North America.

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Of course this analogy cannot be pressed too far without absurdity, but some light may come, I trust, and no offence be given, by pursuing this argument in a spirit of detachment, caught as far as may be from the mood of Machiavelli's Discourses. It is not unfair, I believe, to say that the charming and genial social life of the Southern planters involved "putting back the clock," as does the more forbidding and bleak temper of the Transvaal community. The trekking of the Boers into the Transvaal may be looked on as an act of secession, comparable—when we view the ultimate political action to which it has led—to the secession of the Southern States from the Union. The wholly successful scheme by which the Orange Free State has been involved along with the Transvaal, and the attempted annexation of portions of Cape Colony and Natal, have their American counterpart in the struggle which all but carried out of the Union several border states such as Missouri and Maryland, and quite involved others in the "lost cause." With certain obvious differences there is a close parallel between the pro-Boer Ministry at the Cape, backed by a widespread support from the Dutch throughout that Colony, and the pro-slavery Government of President Buchanan, which gave so much heart to the secessionist movement at the outset, and made President Lincoln's inauguration so precarious a matter. It must not be forgotten that President Buchanan was backed throughout the Northern States by a party who played much the same *rôle* now taken in South Africa by the Dutch. In the heat of those anxious days this party of Southern sympathizers got the lurid name of "Copperheads." Circumstances alter cases, and it will hardly be deemed necessary to resort to so vitriolic an appellation in South Africa, although signs are not lacking of great exasperation produced among British soldiers in the field by the activity of Dutch spies, whose transatlantic counterparts so tried the armies of the North. To mention just one more of the striking similarities in the situation created in South Africa by the present

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war and that which President Lincoln had to face in the early sixties:—The United States army was largely officered by Southerners who went over to the Southern side carrying with them appurtenances of war, a military training received at the cost of the United States, and, in several extreme cases, actual forts and strongholds belonging to the Federal Government. All this had been made possible by a political situation at Washington, which has striking analogies with that created by the Boer oligarchy at Pretoria. The Boers used their exclusive political power to levy on the Outlanders the means for entering upon their long-projected war, just as the Southerners used their disproportionate representation in Congress—based upon their large population of disfranchised slaves and downtrodden proletarians —to make themselves ready for what Seward so graphically named "the irrepressible conflict." Thus the Northern citizen stood, before the Civil War, in a position analogous to that of the Outlanders, whose industry has supplied the means used by the Boers in making ready for their "irrepressible conflict." The Northerner, however, had his remedy, and used it by choosing Lincoln to be President.

But in the South there was a not inconsiderable body of white men who were practically, though not nominally, in the position of inferiority to which the Boers have reduced the Outlanders. They were known by the generic name of "poor whites," or called, less benevolently, "white trash"; and it is recorded that their social and political *status* was often not one to be envied even by the negro slaves. Such uncertain accounts as are given of Lincoln's ultimate ancestry in Virginia suggest that his family belonged to this class. If Sir Alfred Milner's description of the Transvaal Outlanders as in the condition of "helots" be deemed extravagant, he might, perhaps, be induced to amend it by substituting the American phrase "white trash." If the animus of the pro-slavery oligarchy in America towards their "poor whites" is defined and elucidated by the Boers' attitude towards their Outlanders, that of the Boer oligarchy

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towards the native and semi-savage African aborigines is in turn illuminated by the resolute revindication of slavery by the American Confederates. The Southern Confederacy and the South African Republic resemble one another not only in numerous circumstances characterizing their respective struggles for international independence, but also in the nature of the egregious blunder in statecraft, regarded by each as a supreme counsel of political perfection. The foundations of both are slavery and an anxiously restricted franchise, together with a resolute and effective military organization of the governing few. It is not a little remarkable that the last half of our democratic century should have to record the fighting out of the same issues between the few and the many, slavery and freedom, in two great wars, one in North America, and the other in South Africa. The "lost cause" seems, indeed, to die hard, and only to disappear in one quarter of the globe in order to reassert itself elsewhere, and it remains hidden from us whether a third great contest may not be somewhere impending before Machiavelli's dicta that liberty is the first foundation of durable empire, and that only those states are fit for empire that are liberal of naturalization, pass into universal currency as the accepted axioms of every man's political philosophy. This being a very possible contingency, not only Englishmen, but we Americans also, must rejoice in noting the temper of patriotic unanimity in which the English people and the whole English Empire are entering upon a struggle which proves, upon close scrutiny, to involve, in the circumstances attending it, and, above all, in the motives underlying it, the political principles now apparently entrusted to the safe-keeping of English-speaking states, though an Italian first stated them in their modern form. We must also hail with delight everything which shows that to-day, as four centuries ago when Machiavelli noted it, England is intrepid in the prosecution of her war, "because of the wisdom of the king, and the fact that his kingdom is well-ordered and does not

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neglect in times of peace the preparations required for war."

Just here, however, the objector will recur to the principle of nationality, and may urge that the Boers and the Afrikanders have as much right to organize themselves politically as any other nationality, and it will naturally be pointed out that the Southern Confederacy was not, like the South African Republic, of a different nationality from those against affiliation with whom it protested. I think the domineering temper shown by the eager haste with which various proclamations of annexation have been made in South Africa is enough to dispose of this point. The international independence of the military oligarchy of the Transvaal is only the more incompatible with the political organizations surrounding it and the rights of those dwelling within its borders, because its nationality is Dutch. Indeed, the Dutch are demonstrably unfit for empire just because they are peculiarly incapacitated for maintaining general control anywhere and at the same time respecting the legitimate susceptibilities of subordinated subjects and states. This is a problem which is in no sense solved by their colonial administration, and which, had they been capable of expansion, ought to have been solved in time to prevent the sundering of Belgium from Holland. Continued union would have been possible if the Dutch had shown political sense. When an appeal is made to the principle of nationality, and a claim to impose special institutions over a wide area accompanies it, the ultimate question must be one of military efficiency. Have the Boers the requisite material resources and military backing for their project of establishing their Confederate States of South Africa? If they have, their unfitness for empire still ensures its ultimate failure; if they have not, it will very soon give place to liberty and federation under the British Crown.

In his Art of War* Machiavelli declares that the ideal

* Book VII, towards the end.

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military organization—by which he understood one after the manner of the ancient Romans—requires a state of a certain size, one whose prince shall be able to muster from among his own subjects 15,000 or 20,000 young soldier-lads. He maintained that no state smaller than this had any chance of permanent independence. Times have changed, and with them the art of war has grown so much more complete, the populations under various governments have so vastly increased that Machiavelli would have to raise his minimum very considerably. It is growing plainer and plainer that small Powers, though they be nations so far as language and institutions go, have seen their day, and are likely, without necessarily losing liberty or nationality, to be absorbed into larger empires. However this may be, Machiavelli would be bound to apply his own supreme test of efficiency in government, and here again he would find the Boers seriously deficient. His greatest merit lay in seeing things as they are, clearly and unflinchingly. Therefore, he would not have sympathized either with those who indignantly clamor for the independence of the Filipino Republic, or for those, if such there be, who would incorporate Kaffirs and Zulus into the South African body politic. He would, however, have read in the annals of the great American Civil War the lesson that a *status* of slavery for the semi-savages of our day was incompatible with a sound modern state policy, just as he recognized that in his own day the "antique" custom of enslaving prisoners of war was wholly out of date,* and strictly demonstrated that states who were chary of giving their franchises to new-comers were unfit for empire.

*Art of War, Book II., end

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THE POETRY OF SOCIAL REFORM.*

By CHARLES MILLS GAYLEY.

That the camel should go through the eye of the needle is easier than that the literature of purpose should become poetry. For poetry is a natural movement, an unconscious product. When it professes a didactic aim it passes out of the ken of art. Preaching and teaching may justify oratory and science; they should not be urged as justifying the existence of poetry. They would make of poetry an instrument, a means to an end; whereas poetry is an end in itself. I do not mean that poetry is not ethical, but that it must not be pedagogic. At that word poetry shudders. Poetry is, indeed, based upon foundations of truth and right; not, however, to convince men of their value, but to utter their beauty. It fulfills truth and righteousness the more powerfully because unconsciously. It persuades without argument. It convicts without attorney or brief. It moves men by moving their hearts; it fires them with its own ideals; it deepens sympathy; it glorifies imagination; it changes the face of empires. Therefore, in a real sense is there such a thing as the poetry of reform; and in a real sense nowadays (when, on one side, art for art's sake is preached, and, on the other, a gospel of utilitarianism which banishes art), is it wise that we should consider the efforts which poet-reformers have made to assist the social progress of the century. We shall see that

*An address delivered, in November, 1900, before the Channing Club, San Francisco, and the Teachers' Institute, Willows, California.

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though poetry cannot subordinate itself to the conscious inculcation of intellectual or moral ideas, it has contributed largely in this, as in other centuries, to their appreciation, because it has brought them home to men in terms of figure and of feeling.

I shall confine myself to some English poets and to the political, and sometimes economic, movements with which they were identified. Some of these poets are but names to us—more's the shame, for they were real enough persons to our grandfathers; none of them more so than Ebenezer Elliott.

We can hardly realize to-day the straitened condition of the English poor at the end of the Napoleonic wars. The unusually high taxation fell principally upon the shoulders of the middle and lower classes. Bad enough was the prohibitive tariff on corn and breadstuffs, upheld by great land-owners, though it resulted in famine prices for bread. If, in addition to this we estimate the temporary displacement of labor by the introduction of new machinery, we shall perhaps understand why it was that the gap between rich and poor daily widened, until, as Wilhelm Müller says, "the free Englishman who possessed neither pedigree nor property had a position scarcely better than that of the plebeians at the beginning of the Roman republic." Hence the anti-corn-law riots; hence in 1819, the massacre of Peterloo; hence the agitation against a legislative system that existed for the benefit of privileged classes; hence the corn-law rhymes of Ebenezer Elliott.

He was born in 1781, the son of a poor clerk in a Yorkshire iron works. From youth he knew the stringency of circumstance; his education was, therefore, self-acquired. "It was, however, not the bread-tax," says Dowden, "that first made him a poet, but a picture of a primrose in Sowerby's 'English Botany.' This sent him to the country lanes," and hence his rarer verse. But no less sincere, though less beautiful as more direct and fierce, are the "Rhymes" of 1827 and 1828. At the poetry of

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"Child, is thy father dead?
Father is gone!
Why did they tax his bread?
God's will be done!"

it is easy to sneer, but not at the pathos; nor at the confidence in a larger hope:

"Mother says death is best;
We have no place of rest—
Yes, we have one!"

How to rouse the oppressed to a sense of their degredation Elliott knew—"Wilt thou," asks he of the Briton,

"—deaf to hiss and groan,
Breed white slaves for every zone?
Make yon robber feed his own,
Then proclaim thyself a man;"—

and how with righteous scorn to scourge the "powers" that with "pomp and gold and gem" insult the free. "Madmen," he calls them, in his Battle Song:

"Madmen! they trample into snakes
The wormy clod!
Like fire, beneath their feet awakes
The sword of God!"

But as here, so always, in the white light of his anger the saving heat is that of patience and of prayer. Of such is the noble proem to his People's Anthem:

"When wilt thou save the people?
O, God of mercy, when!
Not kings and lords, but nations!
Not thrones and crowns, but men.
Flowers of thy heart, O God, are they:
Let them not pass like weeds away—
Their heritage a sunless day.
God save the people!"

Through his Poet's Epitaph, Win-Hill, and the nature poems rings the same indignation; and in the same faith finds its response:

"But should'st Thou wreck our fatherland
And mix it with the deep,

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Safe in the hollow of Thine hand
Thy little ones would sleep."

This is the poet of whom our own Whittier wrote:

"On these pale lips the smothered thought
Which England's millions feel,
A fierce and fearful splendor caught
As from his forge of steel.

Strong-armed as Thor,—a shower of fire
His smitten anvil flung;
God's curse, Earth's wrong, dumb hunger's ire,—
He gave them all a tongue."

To the overthrow of the detested bread tax in 1846, these nigh-forgotten rhymes contributed more than we know. None can tell to what degree their vividness and candor moved the hearts of Villiers, Cobden, and Bright; but these verses were themselves the heart of the movement of which those statesmen became the head.

I have lingered over Elliott because he builded so much better than he knew. He is the untitled founder of a line of devoted singers; harbingers of a brighter day,—many of whom, like him, spent themselves for poverty's sake and are not even shadowed in the memory of those who enjoy the fruit of their labors. Some, like Eliza Cook and Ernest Jones, were poets of the Chartist movement, which for some time ran parallel with the anti-corn-law, and aimed to supplement the First Reform Bill.

A superficial reader of English history might imagine that the Reform bill of 1832 was a panacea for the legislative evils of the day. The bill did much for the middle, but little if anything for the lower classes. The Chartist movement attempted to secure for all a share in the government. Several of its demands are so reasonable that we, who have fallen on happier times, wonder that they were not from the first made a subject of consideration: manhood suffrage, for instance, and vote by ballot, and the removal of the property qualification for eligibility to Parliament. The poor were once more alive to their

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exclusion from the law-making body; feeling ran high; and the agitation for this "people's charter," begun in 1839, continued with crises more or less severe for ten years. Some of the leaders—Frost, for instance, and Feargus O'Connor, may have been fanatics, but other some, like the poetic Thomas Cooper, were both sane and unselfish. "Among them," says Justin McCarthy, "were men of great ability and eloquence; some were impassioned young poets, drawn from the class whom Kingsley has described in his Alton Locke; some were men of education. * * * So far as we can judge, all, or nearly all, were sincere." Elliott also supported this movement till he was driven out by its opposition to his Anti-Corn Law League, which the Chartists condemned as savoring of compromise.

Eliza Cook was not a great poet, but few English writers have had more instant vogue among the common people. Her verses are occasionally wooden and their sentiment trite: but they hold fast by truth; they have pathos, they are fraught with good sense, they inculcate manliness and patriotism. They strike home. "Onward" is her call to The People of England:

"Onward! Liberty and Reason!
This is now broad Europe's shout;
England, it were moral treason,
Were thy lion voice left out.

"Britons! keep your banner waving;
Hang it forth in Freedom's sun;
But beware the braggart raving
That would talk of sword and gun!

* * * * * * *

"Show that ye have sense and feeling,
Fit to gain and guard your place;
Let your own determined dealing
Meet oppression, face to face!

* * * * * * *

"Let the great ones, high in station,
Lift their eyes, and see at length,
Ye are pillars in the nation,
That alone insure its strength!

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"Tell your rulers they must levy
Fairer weights on wearied backs!
Say the coffers that are heavy
Best can yield the heavy tax!

"Tell the Church, its first great Pastor
Had no gathered store to count;
Little had the Christian Master
For His 'Sermon on the Mount!'

* * * * * * *

"Show that ye have bravely risen;
That ye are not 'brutes' and 'fools;'
Say that ye will shun the prison,
When they give ye work and schools!

* * * * * * *

"Let 'the People' have their 'college;'
Untaught men are fearful things;
Only crucibles of knowledge
Serve to melt Crime's fetter-rings.

"Sons of England, be ye steady!
'Tis your heads, and not your hands,
That shall prove you fit and ready
To enlist in Freedom's bands."

One may grant at once the dearth of imagination and creative power, but one cannot deny the force of wisdom, indignation, and satire. Mr. Ingram falls into scholastic error when he writes "Beauty rather than morality may be the truest theme for poetry," for beauty is not a theme but an aspect of the significance of life with which poetry deals; still, he is right when he says, "The class of readers Eliza Cook appealed to were better able to understand and profit by moral themes than by æsthetic, especially when they were presented to them in a self-respective instead of in the usual maw-worm manner." Yet Miss Cook was by no means destitute of artistic power. No one who knows an English 'common' can fail to appreciate the realism of God Speed the Plow; and none who has an ear to hear can resist the music of

"There's the thick and dingled cover
Where the hare and pheasant play,

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There are sheets of rosy clover,
There are hedges crowned with May."

A deal of æsthetic enthusiasm there is in these lines to the rich who count in coin the value of earth's gifts. "Your hives but hold my honey, for they all belong to me."

The poet is intensely national. Witness her Raising the Maypole and her lines on The Englishman. That a singer formerly so popular should now be known only by a domestic strain or two is odd. Born in 1812, she died only eleven years ago, after a period of ill-health which had long retired her from active life. But she accomplished that to which she had set her hand. "There shall never be one lost good," said Abt Vogler, "what was shall live as before."

Ernest Charles Jones, born in 1819, godson of that Ernest of Cumberland who became King of Hanover, was one of the young men of position and culture attracted to the Chartist cause by the conviction that under the agitation lay a real grievance, and by the hope that a representative legislature might provide a means by which the working classes should lift themselves out of their destitute and powerless condition. Admitted to the bar in 1844, with admirable training and influential friends, Ernest Jones had apparently a brilliant career before him. But as at eleven years of age he had run away from home to help the Poles, so now at twenty-five he ran away from his prospects in society and at the bar to speak and write for the people of England. To his ability as a speaker John Bright has paid the highest tribute. So did the government, which in 1848 clapped him into prison for an address that from our point of view is noteworthy for its eloquent common sense. For this alleged sedition he was sentenced to two years' solitary confinement on bread and water. During this period he wrote verses with pens made, Mr. Miles tells us in his Poets and Poetry of the Century, from rooks' feathers picked up in the prison yard and shaped by a razor lent him for his toilet. His ink was stored in a piece of soap. Some of these poems appeal to

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one with particular force; for instance, that which closes

"They'll find me still unchanged and strong
When breaks their puny thrall;
With hate for not one living soul—
And pity for them all."

"His entire unselfishness," says Mr. Miles, "and his unbounded sympathy with the downtrodden and oppressed are everywhere demonstrated in his career." Again and again he declined comfort and affluence, preferring the hardships of the cause to which he had devoted himself. His will kept him an agitator, despised of the class in which he was born; his newspaper, Notes to the People, kept him poor. In spite of all, however, he rose to eminence as a barrister in Manchester, 1861–1869, was courted by various parliamentary constituencies, and just before his death was returned as member for his own town. When he was thirty years old and in jail, he had written "Hope's the lamp I'll take for sleeping when I wish the world good night." Broken by his labors for the poor, he took that lamp at fifty.

Of Jones' Songs of Democracy, the critic already quoted says that it is difficult to imagine anything better for their purpose, and that while they lack the bitter intensity of Elliott's Rhymes, they are, in their simple directness, better calculated for popular use. This verdict is confirmed by the Song of the Factory Slave:

"The land it is the landlord's;
The trader's is the sea;
The ore the usurer's coffer fills,
But what remains for me?

* * * * * * *

The camp, the pulpit, and the law,
For rich men's sons are free;
Theirs, theirs are learning, art, and arms;
But what remains for me?
The coming hope, the future day,
When wrong to right shall bow,
And hearts that have the courage, man,
To make that future *now*.

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"I pay for all their learning,
I toil for all their ease;
They render back in coin for coin,
Want, ignorance, disease;—
Toil—toil—and then, a cheerless home,
Their hungry passions cross,
Eternal gain to them, that give
To me eternal loss!
The hour of leisure happiness
The rich alone may see;
The playful child, the smiling wife—
But what remains for me?

* * * * * * *

"We bear the wrong in silence,
We store it in our brain;
They think us dull—they think us dead:
But we shall rise again:
A trumpet through the lands will ring;
A heaving thro' the mass;
A trampling thro' their palaces,
Until they break like glass:
We'll cease to weep by cherished graves,
From lonely homes will flee,
And still as rolls our million-march,
Its watchward brave shall be:—
The coming hope—the future day,
Then wrong to right shall bow,
And hearts that have the courage, man,
To make that future now."

Justin McCarthy calls Ernest Jones "almost a genius." I hold that he is a genius, but forgotten for a while. His poems are songs, and to select is to mutilate. For they surge to a climax and sing as they go. What can be more passionate, more relentless, more inherently rhythmical than his Song of the Lower Classes:

"We plough and sow, we're so very, very low,
That we delve in the dirty clay,
Till we bless the plain—with the golden grain,
And the vale with the fragrant hay.
Our place we know—we're so very low,
'Tis down at the landlord's feet:
We're not too low—the bread to grow,
But too low the bread to eat.

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* * * * * * *

"We're low—we're low—we're very, very low,
Yet from our fingers glide
The silken flow—and the robes that glow
Round the limbs of the sons of pride.
And what we get—and what we give,
We know, and we know our share;
We're not too low the cloth to weave,
But too low the cloth to wear!"

That is the whip-lash style that stings a people to a sense of its degradation; but here is the music of the march—the Song of the Day Laborers:

"Sharpen the sickle. How proud they stand
In the pomp of their golden grain!
But I'm thinking, ere noon, 'neath the sweep of my hand,
How many will lie on the plain!
Though the ditch be wide, the fence be high,
There's a spirit to carry us o'er,
For God never meant His people to die
In sight of so rich a store.

"Sharpen the sickle. How full the ears!
Our children are crying for bread!
And the field has been watered with orphan's tears
And enriched with their fathers dead,
And hopes that are buried, and hearts that broke
Lie deep in the treasuring sod:
Then sweep down the grain with a thunder stroke,
In the name of humanity's God!"

Though the social revolution of 1848 made no particular headway in England, more than its echo, something of its spirit, is caught in the verses of Massey and Brough. The elder of the two, Gerald Massey, born in 1828, had been a factory lad himself and had eaten the bread of necessity during his youth. But with indomitable energy he taught himself to write, and with sympathy devoted his best to the people. His Cries of 'Forty-eight are "full of passionate declamation," says Alfred Miles, but they are also full of hope and sound teaching. What could be better as a song for the discontented than that which begins:

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"There lives a voice within me, a guest-angel of my heart,
And its bird-like warbles win me till the tears a-tremble start;
Up evermore it springeth, like some magic melody,
And evermore it singeth its sweet song of songs to me;
This world is full of beauty, as other worlds above,
And, if we did our duty, it might be as full of love."

As this is exquisite, so the Song of To-day and To-morrow is courageous, with the courage born of pathos:

" 'Tis weary watching wave by wave,
And yet the tide heaves onward;
We climb like corals, grave by grave,
That pave a pathway sunward;
We are driven back for our next fray,
A newer strength to borrow,
And where the vanguard camps to-day
The rear shall rest to-morrow.

* * * * * * *

"Though hearts brood o'er the past, our eyes
With smiling futures glisten!
For lo! our day bursts up the skies—
Lean out your souls and listen!
The world is rolling freedom's way,
And ripening with her sorrow;
Take heart! who bear the Cross to-day
Shall wear the Crown to-morrow!"

There are few nobler poets of the poor than Gerald Massey. With the exception of William Morris, I doubt whether any have evinced a truer inspiration or a surer genius. He is national to the core, optimistic, creative—this Christian socialist, friend, as his biographer tells us, of Frederick Maurice, Charles Kingsley, and George Eliot—this, the prototype of "Felix Holt, the Radical." Devoted though he is to a cause, Massey is not limited in range or theme; not a faddist. He has written poems of war and civil life and home, of nature and the individual soul as well, and with signal success. His conceptions are philosophical, his images full of beauty, his lines melodious. He has been well called "a born laureate of the people, one of the most thoroughly English poets of the century;" and

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he is an anointed prophet of that highest of world faiths, Christian evolution:

> "Race after race hath caught its likeness of
> The Maker, as the eyes grew large with love."

It is a pity that our limits forbid the insertion of at least one of the clever and caustic Songs of the Governing Classes, written by Robert Brough, journalist and dramatic author. Published in 1855, they are characterized by hatred of shams, detestation of political self-seeking, and scorn of hereditary claims to govern or to oppress. The irony of The Marquis of Carabas, with its Beranger refrain is delicious:

> "Off with your hat! along the streets
> His lordship's carriage rolls;
> Respect to greatness when it shines
> To cheer our darkened souls!
> Get off the step, you ragged boys!
> Policeman, where's your staff?
> This is a sight to check with awe
> The most irreverent laugh."

Then follows the recital of his lordship's dignities, and deformities; his noble descent (from a king's cousin and an oyster wench), the adroit self-sacrifice of his forbears, and their well-paid duplicity:

> "Now see, where, focus'd on one head
> The race's glories shine;
> The head gets narrow at the top,
> But mark the jaw—how fine!
> Don't call it satyr-like; you'll wound
> Some scores, whose honest pates
> The self-same type present, upon
> The Carabas estates."

His brow is scarce wrinkled, "brows keep so, that have not got to think." His hand is tiny: it never penned a useful line; ne'er worked a deed of fame, save slaying one whose honor he had blasted.

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"They've got him in. He's gone to vote
Your rights and mine away;
Perchance our lives, should men be scarce
To fight his cause for pay.
We are his slaves! he owns our lands,
Our woods, our seas and skies;
He'd have us shot like vicious dogs,
Should we in murm'ring rise!
Chapeau bas!
Chapeau bas!
Gloire au Marquis de Carabas."

Of similar style and equal bitterness is My Lord Tomnoddy, who "writes his name with indifferent ease, and is rather uncertain about the 'd's,"

"But what does it matter, if three or one,
To the Earl of Fitzdotterel's eldest son."

He's M.P. at twenty-one, though he cannot speak. He is lieutenant at twenty-three, captain at twenty-six, colonel at thirty-three, though "he never drew sword except in drill." Soon

"My lord in the Peers will take his place:
Her Majesty's councils his words will grace.
And what are his qualifications? *One!*
He's the Earl of Fitzdodderel's eldest son."

In this sequence belong also Mathilde Blind's vitrolic but unequal verses, entitled The Heather on Fire, with which she scored those who, in 1866, evicted their highland crofters, that the landlord

"might abide
In all the pomp and power of lordly pride,
Riot in lawless loves, or, if he please,
Have a refreshing change of palaces."

Here, too, should be recalled well-known strains of defiance and lament from the sister isle, too many to be named in detail, and too good to be huddled into selections —the music of Moore's Melodies, the liquid fire of Mangan's Dark Rosaleen, Lady Dufferin's Lament of the Irish Emigrant, Ellen O'Leary's

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"The dead who died for Ireland
In exile—poor—in pain;
Dreaming sweet dreams of the hills and streams
They never should see again,"—

the verses of Gerald Griffin, and T. D. Sullivan, and many another.

The utterances of the better-known princes of song and champions of the oppressed, Swinburne and Morris, require separate treatment. The latter, perhaps, deserves to be considered with the creative idealists of the century, the philosopher-poets, the Wordsworths and Shelleys. As for Swinburne, though in his Songs before Sunrise he froths overmuch and unduly gnashes the teeth at "Man's royal ties, and great men's breath and words of kings," his spirit is a whirlwind and a consuming fire, and his music a wonder: trumpets and trombones and the barbaric clashing of cymbals, with lulling intervals of harp and lute; and so the sense is ravished with the sound. Maybe there is a meaning; if one will seek.

From the bewilderment of that we turn with gratitude to William Morris, who of the twain is the surer poet and saner guide. Through the very sectarianism of his Chants for Socialists breathes the hope of his humanity. "Is it war?" he calls to the rich:

"Is it war, then? Will ye perish as the dry-wood in the fire?
Is it peace? Then be ye of us, let your hope be our desire.
Come and live! for life awaketh, and the world shall never tire;
And hope is marching on."

Such masters of verse demand consideration by themselves. So does the poetry of an aspect of social reform—barely touched upon in this paper—the humanitarian. For the adjustment of industrial relations has given birth during this century to a poetry of starving children and stricken women which would fill a volume of itself.

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THE POWER AND METHODS OF HEREDITY.

By Wm. E. Ritter.

II.

Discussion of the question of whether or not these extra-ancestral, or acquired, characters are transmissible is prone to run into the tangled and obscure ways of biological fact and speculation. It is, however, purely a question of fact with which we have to do; and a position with reference to it that is justified by the present state of science is dependent more upon the ability to withhold conclusions until the evidence is all in, and then rightly to estimate the value of this evidence, than upon deep learning in biological science.

One class of persons declares that such characters are transmitted; another that they are not; while a third is in doubt about it. The *onus* of the situation is evidently on the first class. A writer of good repute belonging to this class has recently affirmed that there is not a particle of proof that the particular characters considered by him are not transmitted. To this the doubting Thomases reply of course that the perpetuation of their state of mind requires only the pointing out of weak spots in the affirmative evidence. To present a proposition and then require those who express doubts about its truth to prove it *not* to be true, even though a certain amount of circumstantial evidence be adduced in its support, does not carry in science any more than in the law court.

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Again, a rather widely prevailing attitude on the question makes it important to note that it is not incumbent on the doubter to maintain some counter theory to bolster up his doubts. It is, for example, frequently urged by transmissionists in support of their contention that many of the directions in which racial changes have gone, cannot be accounted for by any theory that excludes the transmission of acquired characters. Of course if it could be conclusively shown that any piece of actually accomplished evolution must of necessity have depended on such transmission, this argument would be valid. The thesis is not, however, that evolution is impossible without this assumption, but that the assumption itself is true, and as long as this is the position, those who hold it should stand up to the rack squarely. By so doing, the clinching evidence, which everybody is anxious to find, if it exists, will the sooner be forthcoming. The impossibility-of-improvement argument is found to be a frail breastwork when it is remembered that the doubter always may if he chooses remind him who takes refuge behind it, not only of the possibility but even of the probability, that factors in the evolutionary process as yet wholly unknown or unappreciated may turn up any day that will cut the ground from under him entirely.

I have stated that the gathering in of all the evidence and the cross-questioning of it thoroughly is the only way by which a position on the subject unqualifiedly justified by the present state of science can be obtained. It is manifestly impossible in the limits of a brief paper to examine more than a fragment of the evidence that has been offered. We must, therefore, get as much as we can by fixing our attention upon a few instances, as weighty ones as we can find, drawn from as many fields of biology as circumstances will permit us to enter.

I first take a case or two from the domain of man's efforts toward the training and improvement of animals. It is almost an axiom among breeders and trainers of

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domestic animals that the offspring of trained animals inherit to some extent the accomplishments which their parents have acquired through training. The improvements that have been wrought in the speed of trotting horses, for example, are believed to be due, at least in part, to this cause. I select this case because it is held by transmissionists to be a particularly strong one, and further because there is a large body of precise data bearing upon it, and this has been carefully considered by an ardent upholder of the horsemen's belief in the matter.* According to Professor Brewer the earliest accepted three-minute record for a mile race in this country was made in 1818. From that time down to 1892 the improvement by decades, or nearly that, was as follows: for the first decade, from 3 minutes to 2 minutes and 34 seconds: for the second decade, from 2:34 to 2:31½; for the third, from 2:31½ to 2:29½; for the fourth, from 2:29½ to 2:24½; for the fifth, from 2:24½ to 2:17¼; for the sixth, from 2:17¼ to 2:13¼; for the seventh, from 2:13¼ to 2:08¾; then from 1888, the end of the seventh, to 1892, from 2:08¾ to 2:08½.

This continuous and marked improvement that has been going on for more than three-quarters of a century is to be explained, the author believes, on the supposition that "Selection has doubtless determined the proper correlation of the various organs involved in the especial evolution, but the increase in speed has only come along with the functional development, which was enhanced by special exercise in the individuals of successive generations." In other words, to state in definite terms what is implied in this explanation, any individual horse, X, highly exercised in trotting, begot progeny capable of trotting faster than this progeny would have been capable of had not the parent been thus exercised. To get positive proof of just this character is clearly impossible. We cannot know what might have been under different conditions in the breeding

* Professor W. H. Brewer, On the Hereditary Transmission of Acquired Characters. *Agricultural Science*, Vol. IV, p. 249, 1892.

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of colts any more than in other classes of events. Evidence of nearly the same weight might be secured in a different way, however. It might possibly be determined whether colts sired by a trotting horse late in life after he had been rigorously and carefully trained, were on the whole faster than those sired by the same animal while young and not yet at all exercised. But evidence of this sort would, in order to escape the vitiating element of individual variation, have to be based on a long series of carefully controlled observations.

No facts of this nature have ever been produced so far as I am aware. At any rate none are presented in Professor Brewer's studies. And this is the only way, so far as I can see, by which direct and final proof could be obtained. The evidence relied upon is entirely indirect and presumptive. It must, consequently, be submitted to particularly close cross-examination. The first question that may be asked hinges upon the fact acknowledged by every transmissionist, and indeed expressly admitted by Professor Brewer, that selection and the training of each particular horse have counted for something—have been in part responsible for the results. If responsible in part, why not wholly? Is it known just what the limit of power of these factors has been in the process? Answers to these queries are not given. Should it be shown, then, that in other similar cases equal or greater improvements have been wrought where the possibility of the transmission of the effects of training are entirely precluded, and training and selection are the only factors that can be invoked, the presumption would rise *almost* to the level of demonstration that in the case of the trotters also these factors alone have been operative.

Such cases are furnished by college athletes. I have examined only the University of California records and the American Intercollegiate records; but have no doubt that every college in the land in which athletics have flourished and records have been kept for some years, would furnish

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evidence of the same nature. For the sake of brevity I consider only the records of our own University. The following table has been made from data obtained from the last "Blue and Gold:"

UNIVERSITY OF CALIFORNIA ATHLETIC RECORDS.

Events.	1879–1885	1899	Actual Improvem't	Per cent. of Improvem't
100-yard dash	10⅘ sec.	10 sec.	⅘ sec.	3.6 +
220-yard dash	23½ sec.	22⅗ sec.	2 9/10 sec.	3.13 +
440-yard dash	54½ sec.	50⅗ sec.	3 1/10 sec.	6.7 +
1-mile run	5:58	4:38⅕ sec.	1:19⅘ sec.	22 +
1-mile walk	8:17½	7:24⅕ sec.	53 1/10 sec.	11.7 +
120-yard hurdle	18 sec.	15⅗ sec.	2⅖ sec.	13.3 +
High jump	5 ft. 5 1/16 in.	5 ft. 11¼ in.	6 5/16 in.	10.33
Broad jump	18 ft. 2½ in.	23 ft. 4 in.	5 ft. 1½ in.	27 +
Shot put	31 ft. 1 in.	40 ft. 5⅝ in.	9 ft. 4⅝ in.	30 —

Comparing the event in the athletic record that probably has the greatest similarity with the trotting race, *viz.*, the mile run, we find that the improvement in the mile run was 22 + % in twenty years, while that in the trotting race was 28.6% in seventy-four years. Or to put the comparison on a juster basis, during the first twenty years in which the running race was in vogue the record was improved 22 + %; while during the first thirty years in the history of trotting (data are not furnished for the first twenty years alone) the improvement was only 16.9%.

Various other deductions of interest as bearing upon our problem may be made from a study of the data, but want of space prevents me from noticing more than one other. It will be seen from the table of athletic records that the events in which the greatest improvements have been made are: the shot-put, the broad jump, the mile run, the 120-yard hurdle, the one-mile walk, and the high jump, while the least improvements have been in the three "dashes." In general this is the same order of improvement as that shown by the American Intercollegiate records; *i.e.*, it has been greatest in the

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hammer-throw, shot-put, broad jump, pole-vault, 120-yard hurdle, and high jump; in all the others it being much less. That is, improvement has been greatest in those events that are most complex, or are farthest removed from the ordinary bodily activities; or that depend largely, as in the case of the mile run and mile walk, on great endurance. In other words, improvement has been greatest in those events in which practice would be expected to count for most, and where skill and devise—intellectual qualities—would come most into play.

There can be little doubt that should trial of horse prowess in ways more unusual and complex than trotting become popular, like hurdle jumping or going backward, for example, and should selection and training be as carefully practiced here as they have been for trotting, the improvement would be correspondingly greater.

We may summarize the results of this examination thus: We have here two cases in which marked and nearly equal improvements have been effected in performances by the animal organism of much the same character. In the one case the conditions under which these improvements were made, *i.e.*, all in one generation, preclude the transmission of the effects of training from having played any part, and consequently leave the elements of selection and training and skillful manipulation practiced in each individual instance as the only factors that could operate. In the other case there is consequently no ground for assuming that any other element was in operation, particularly since these elements were much the same in both cases.

One more of the numerous points that might be raised, and our cross-examination of this witness must close. It is recognized that improvement cannot go on indefinitely in any of these directions. Trotting and pole-vaulting, for example, will surely reach a limit some time beyond which there will be no further improvement, while horses and men remain essentially what they now are. Why should this be if the effects of exercise are transmitted? It

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would appear that since the training has to be more and more rigorous and careful in order to excel, the more the record is improved, the greater instead of the less should be the likelihood that the effects would be transmitted; and the more so since the supposed inherited new qualities should be becoming better and better established as the generations become more numerous. The transmissionist runs into the limbo, in this class of cases at least, of having to explain how it is that as the conditions held to be most favorable for the transmission of acquired characters become better and better, the less transmission takes place, until finally it ceases entirely. If the reply be made that the very nature of the organism fixes a limit beyond which such acquisitions cannot be transmitted, the troublesome doubter will rejoin that this explanation is satisfactory only so far as concerns efforts that might be made which in themselves reach entirely outside the nature of the organism, like walking on the hands, for example, by man. If, however, it is insisted that the same explanation will apply as well to exercises like those here under consideration that fall strictly within the scope of the organism's normal activities, then the doubting Thomas will become all the more troublesome by pointing out that if this be so transmission of acquired characters, so far as use is concerned, is deprived of all power to modify the organism, and so of being instrumental in the production of new varieties; and so powerless as a factor in evolution, along this line at least. Some factor that *cannot be stopped* in its modifying influence upon the organism by the nature of the organism is precisely what the fact of evolution requires.

We may turn our attention now to a few instances from the realm of habit and instinct. Perhaps no case could be selected here on which transmissionists would rely more implicitly than that of the migrating habit of birds. This wonderful power is almost universally regarded as an instinct established in heredity through the transmission of an acquired habit. Mr. Leverett M. Loomis has been

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investigating the migration of water birds along the Pacific Coast of North America for a number of years. His studies have been as extensive and careful as any that have ever been made in this country on this class of birds, and some of his conclusions* have a direct bearing on our question. I quote, the italics being mine: "These investigations seem to prove (1) that the Shearwaters off Monterey *find their position and shape their course by the landmarks;* (2) that *birds do not possess a mysterious superhuman faculty for determining direction*, else the Shearwaters would not have been bewildered in the fog."

"It seems reasonable to conclude that young birds in the journey from their birthplace to the winter home of the species *are dependent upon the guidance of the old birds who know the way, because they have traveled it.*"

It should be noted that this habit is one particularly well calculated to be transmitted. It is practiced by both sexes; it is begun while the individuals are young and is kept up regularly each year through their life-time; and it involves strenuous physical effort and the keenest sort of exercise of such intelligence as these animals possess. Some of the migrations considered by Mr. Loomis extend nearly half way around the earth, and the obstacles met, as storms and fogs and the procuring of food, are frequently enormous. We might have supposed that it would have become established as an instinct through natural selection alone; and in the absence of more evidence to the contrary it is highly probable that in some cases, at least, this has been done. At any rate, the evidence produced by Mr. Loomis and others that in some birds the migration is dependent upon the *guidance by landmarks* and *other physical conditions;* and upon what *each new generation learns* from older and more experienced birds, throws so much doubt upon the possibility of the transmission through heredity of this habit that evidence from this

* Leverett M. Loomis. California Water Birds, No. IV. Proc. Cal. Acad. of Sci., Zool., Vol. II, No. 3, 1900.

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source must be set aside pending the production of a crucial instance.

With reference to the general question of the transmission of acquired mental traits, it must be admitted that the reading of the masterly chapter on instinct in The Origin of Species, and of such arguments as those contained in Mr. Romanes' essay on The Darwinian Theory of Instinct, produces a very strong general impression on one's mind that such transmissions do play an important part in evolution. When, for instance, one finds Mr. Darwin saying: "It cannot be doubted that young pointer dogs (I have myself seen a striking instance) will sometimes point and even back other dogs the very first time they are taken out," it almost seems as though further doubting is unjustified. If, however, one persists in his cross-examination, as he must if he is to be a loyal seeker after truth regardless of what authority his pursuit may lead him to traverse, he finds that the evidence everywhere falls a little short of conclusiveness. Let us take, for example, these instances of young dogs that point before they are formally taught to do so. That this happens cannot, I think, be denied. But, we are bound to inquire in each particular instance, is it certain that the animal has never during its puppy days or later seen its mother or any other older dog point? And this question becomes more and more pertinent the more we learn of the important part that imitation, even among very young animals, plays in their intellectual development. Again, there are well-nigh insuperable difficulties in the way of making sure that the particular acts are not after all ancestral in the full sense of the word, and hence accountable for through selection. That selection has been an important factor in all these cases there can be no doubt —and it should be noted that with all domestic animals it is not the slow-going, hesitating natural selection with which we have to do, but the rapid and sure selection by man. As regards the pointing habit, for instance, there can be no doubt in the mind of anybody familiar with the

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ways of all sorts of dogs living under all sorts of conditions, particularly with dogs running free in the country, that the innate element needed for selection to work upon is nearly everywhere present. Almost any dog will occasionally, at the scent or suspicion of prey, stop suddenly, crouch, and hold up one fore foot; and this widely prevalent habit was unquestionably the starting place for what is now known as pointing. One might go on indefinitely, did time permit, with the cross-examination in this domain; but it is the less important to carry it further in that those interested may be referred to the excellent chapter on "Are Acquired Habits Inherited?" in C. Lloyd Morgan's Habit and Instinct.

The doubter, even though an unwilling one, who goes to the field of animal habit and instinct in search of convincing evidence that acquired characters are transmissible is obliged, so far as concerns anything yet in reach, to return empty-handed.

We may now examine a few instances from the physician's realm. I select first the question of the transmission of acquired deafness. Professor E. A. Fay* has published the results of his extensive studies on the marriage of the deaf, and they contain data of prime importance not merely for the special question of the transmissibility of acquired deafness, but also for the general problem now occupying us. This work is of great value not only from the fact that it is based upon a far larger number of records of marriages of the deaf than all previous collections put together, the author tells; but because of the searching character of the questions asked of the persons investigated, and the care and variety of the tabulations presented. Trustworthy records of 4,471 marriages are treated.

I reproduce only two of the tables, these containing, however, the essence of what is most important for our purpose.

* Marriages of the Deaf in America. Volta Bureau, Washington, D. C., 1898.

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TABLE I [based on a known number of marriages]:

Marriages of the Deaf	Number of Marriages	Marriages Resulting in Deaf Offspring	
		Number	Percentage
One partner congenitally deaf; the other congenitally deaf or hearing	526	111	21.103
One partner adventitiously deaf; the other adventitiously deaf or hearing	1,155	40	3.463
Total	1,681	151	9.458

TABLE II [based on the number of children investigated, and the condition, but not the number, of parents]:

Marriages of the Deaf	Number of Children	Deaf Children	
		Number	Percentage
One partner congenitally deaf; the other congenitally deaf or hearing	1,307	265	20.275
One partner adventitiously deaf; the other adventitiously deaf or hearing	2,433	56	2.301
Total	3,740	321	8.583

The term "congenitally deaf" is defined as meaning afflicted with deafness that has existed from birth, while "adventitiously deaf" means afflicted with deafness that has come on, no matter how, since birth. A deaf person that has ever heard is classed as adventitiously deaf.

Congenital deafness and adventitious deafness would be, with some important modification of meaning, which I shall consider presently, ancestral and extra-ancestral, or acquired, characters, respectively. Using the author's terms for the moment as though exactly equivalent to our own, we see from the tables that while the likelihood of the transmission of the ancestral character is greater than that

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of the transmission of the extra-ancestral in the proportion of six plus to one, there is yet a rather strong likelihood that the extra-ancestral character will be transmitted; for although we have no tabulated evidence as to the percentage of deaf children born to hearing parents, yet it is admitted on all sides that this is not as great as these tables show, *viz.*, 3.463% in one case, and 2.30% in the other for the transmission of acquired deafness. When, however, we come to consider just what is covered by the term adventitious deafness in the report, the evidence not only cannot be taken as proving the transmission of truly acquired deafness; but on the contrary must be held to be *almost* conclusive proof that such deafness is *not* transmitted. As already pointed out, by adventitious deafness is meant any deafness, no matter how caused, that is known to have come on after birth. Now if this class were limited so as to include only cases known to be actually acquired deafness, there would certainly be excluded many that are now included. Professor Fay fully appreciates the importance of this fact, and I cannot do better in considering it further than to quote his words: "When we remember," he says, "that what is transmitted is not really deafness, but some physical anomaly or tendency to disease of which deafness is but a consequence or the symptom, and that this anomaly or tendency may have been congenital in the parent though deafness did not occur until some later period in life, we see that, even where marriages of adventitiously deaf persons result in deaf offspring, it is possible that the characteristic transmitted may really be a congenital and not an acquired one." As a matter of fact it is not only possible, it is certain that in some cases at least, the characteristic transmitted is congenital and not acquired. For example, it is sometimes so in cases of nervous deafness technically so called. This form of deafness is known to come on quite late in life, and to be accompanied by a history that admits of no doubt of its being dependent upon some congenital "anomaly or tendency."

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The only cases that could be admitted to the adventitiously deaf class were this to be made exactly to correspond to an acquired-deafness class would be those in which hearing had been destroyed during the life-time of the individual by some accident, as by a severe concussion; or by some disease, like scarlet fever or measles which so frequently carry deafness in their train. With such a limitation as this the percentage of deaf offspring would unquestionably be reduced. To what extent it is of course impossible to tell, but the facts taken altogether warrant the supposition that it would be very close, if not quite down to the figure that would hold for the deafness of children born to hearing parents.

Without taking up another specific instance of the supposed transmission of acquired disease, I make the general remark that while the belief in such transmissions is almost universal among physicians, this is perhaps the most difficult domain of all in which to search for the crucial instance. This peculiar difficulty is due chiefly to two things: in the first place, to the fact that congenital weaknesses and tendencies to disease are so given to lying fallow for indefinite periods in the constitution of the organism, awaiting the proper period in the individual's life to come around, or for the proper environmental conditions to present themselves; and in the second place, to the fact that all higher animals, particularly man and the other mammalia, are for so long a time and so constantly and intimately subject to the conditions and influences that begèt the maladies common to their kind. Note the long period of infancy, for example, during which the helpless creature must be so closely cared for by its kindred, must even be fed, in the case of mammals, by a secretion from the body of the mother parent. What need of supposing bacterial diseases—which we now so well know include almost all diseases—to be inherited when there are such golden opportunities after birth to "catch" things! The prolonged human infancy that Mr. Fiske makes so much of is by no means all blessing.

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And how in the world is anyone going to get *proof positive* of the transmission of such a thing as, for example, the *actually acquired* element in near-sightedness? And certainly in the face of such testimony as that produced by Professor Fay with reference to ear troubles nothing short of proof positive can establish the contention with reference to eye troubles.

In deference to the popular interest in the subject, something probably ought to be said here about the inheritance of the effects of injuries. In view, however, of the negative results that have been reached in every case where the subject has been systematically investigated experimentally, I need do no more than refer to some of the most noteworthy of these investigations. Among these I would first mention the reëxamination by Mr. Romanes, a transmissionist it will be remembered, of Brown-Sequard's famous case of inherited epilepsy due to mutilation, in guinea pigs. Romanes failed to confirm the results obtained by the French physiologist. Weissman's extensive series of experiments, with negative results, on breeding mice from parents with amputated tails may be next mentioned. Then attention may be called to the exceedingly important experiments, virtually, of the compressed feet of Chinese women, and of the heads of flat-head Indians.

In conclusion I may state in the form of a brief summary what, so far as I am able to make out, partly from evidence of the sort presented in this paper, but more from evidence that it has not been possible to touch at all, is the best that biological science is able to do at present with this difficult but vastly important problem.

1. Among the lower organisms, meaning by this not merely the protozoa and the protophyta, but including as well some of the lower metazoa and metaphyta, acquired characters may be transmitted,

2. Among the higher animals and man the evidence is not sufficient, in view of the many good grounds for doubt, to justify the conclusion that such transmissions ever do take place; and,

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3. As the affirmative testimony now stands, if a few of the most probable cases should be accepted as valid, it would have to be recognized that the laws and conditions under which the inheritances take place are wholly unknown to us, and would have to be interpreted as in the nature of freaks and sports, and hence without much significance in the evolutionary process.

4. The immunity of the heredity-power of the organism from somatic influences has been gradually acquired in the course of evolution, and does not depend upon an initial, fundamental difference between Germ Plasm and Somatic Plasm, as supposed by the Weissmannean theory.

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EVOLUTION AND THE THEORY OF PROBABILITY.*

By ALBERT W. WHITNEY.

I shall try to show you this evening how the study of organic evolution may be treated as an exact science. And there is need for such treatment; the workings of evolution can hardly be further illuminated without abandoning vague speculation about the strength and effects of heredity, natural selection, and variation, for exact definitions and exact measurements.

Now perhaps you are saying to yourselves: "We are about to be told how to know the height of a man from knowing the height of his parents." Not so; and still I insist we are dealing with an exact science.

If you throw two coins into the air I dare not say that one will fall head up and the other tail up. If you throw a million coins into the air, however, I dare say that the difference one way or the other from an equal division of heads and tails will not amount to the one five-hundredth part of the whole number of coins.

I dare not make a statement about a small number of coins, but I dare to make one about a large number of coins. I dare not make a statement about a single father and son, but I dare to make one about the million sons of a million fathers; I might tell you, for instance, what proportion of sons will be taller than their fathers. In this

*Read before the Science Association, March 21, 1900.

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sense, from this point of view, our science is exact; and the point of view is well taken. Chemistry is counted an exact science, but we do not know the exact behavior of each molecule.

Before beginning with biology, I must say more of tossing coins and spinning tops and drawing balls from urns—exercises in which the laws of chance are most easily discerned. And here it is in place for me to explain that much of what I have to say to-night I have taken from the work of Karl Pearson, Professor of Applied Mathematics in University College, London. Of the rapidly growing literature on the subject, Quetelet's work in which he applied the theory of probability to the study of statistics and Francis Galton's more specific application of it to anthropology, particularly in his Natural Inheritance, are doubtless most important; but Karl Pearson, going on with the ideas of Quetelet and Galton, has perhaps done most to formulate the subject clearly.

If you throw five coins into the air, some will come down heads up, some tails up; or perhaps they may all fall heads up; or all tails up. Suppose you do this a thousand times, keeping track each time of the number of heads; then count the number of times that no heads have come up, that one head has come up, two heads, three heads, four heads, five heads. You are right in suspecting that there will be an orderliness about these results, and hence in supposing that if another thousand trials were made the results would be nearly similar. The results in fact would not be far from these,—but wait, let me give you the result of 1,696 throws of five coins made by the members of one of my classes:

Number of times 0 heads came up	62	53
Number of times 1 head came up	257	265
Number of times 2 heads came up	546	530
Number of times 3 heads came up	504	530
Number of times 4 heads came up	259	265
Number of times 5 heads came up	68	53
	1,696	1,696

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The numbers to the right give the most probable distribution, calculated very simply from the assumption that a head is as likely to turn up as a tail; you will notice the numbers are in the ratio 1:5:10:10:5:1 or the coefficients in the expansion of $(x+y)^5$ by the binomial theorem. You see the correspondence between the two series above is very close; and we may be very sure that the correspondence between two similar series for the case of say a million throws would be far closer.

If we form the ratio of each of the numbers in the columns above to 1,696 we obtain on the right $^1/_{32}$, $^5/_{32}$, $^{10}/_{32}$, $^{10}/_{32}$, $^5/_{32}$, $^1/_{32}$, the terms in the expansion of $(\frac{1}{2}+\frac{1}{2})^5$. These are the fractions that express the probabilities of the various occurrences; their sum is 1; this is to be interpreted as certainty, since some one of these possibilities must occur. We may illustrate all this graphically (Fig. I) by erecting as ordinates $^1/_{32}$, $^5/_{32}$, $^{10}/_{32}$ . . . . at points whose abscissas are 0, 1, 2 . . . . , taking more conveniently a larger scale for the ordinates than for the abscissas. We shall thus obtain a series of points which may be joined by straight lines out of deference to the eye's preference for a closed figure. The dotted line in Figure I represents similarly the actual result of the 1,696 throws.

If, instead of throwing coins into the air, we had spun five three-sided tops together one thousand times, each top having one side painted red, and had kept track of the number of times no red side, one red side, two red sides, etc., came up, we should have obtained a result much like the former one, but with this difference: before there was an even chance each time for head or tail; that produced a symmetrical distribution—there was the same chance with five tosses for three heads as for two heads; but with our top the odds are each time two to one against a red side coming up, and so there is not as great a probability of three reds as of two reds; we therefore get an unsymmetrical polygon, given in fact by plotting the terms of $(\frac{1}{3}+\frac{2}{3})^5$ (Fig. II). Tops with greater numbers of sides would give polygons with various degrees of asymmetry.

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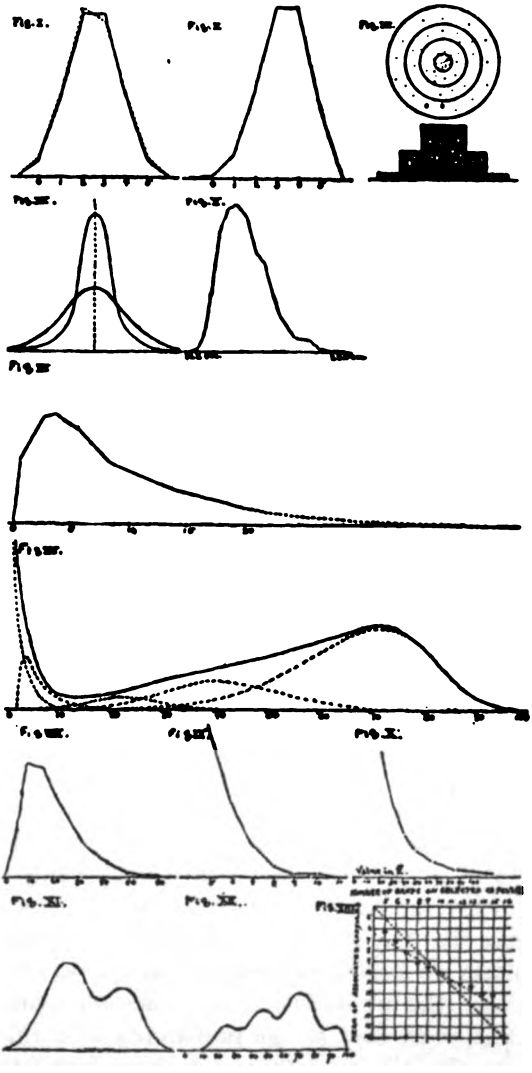

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As the number of sides of our polygons increases, that is, as we throw up together a greater number of coins or spin together a greater number of tops, our polygons come to look more and more like curves, and our coin-tossing polygons in particular resemble a most interesting curve called the normal curve of probability; and, indeed, there is a real mathematical resemblance between the two.

When a rifleman shoots at a target, in general the bullets will prove to be distributed in a somewhat even way about the center; most thickly near the center with only a few scattering bullets at any great distance. If now, as the bullets strike the target they drop down into a receptacle with a level bottom and vertical partitions (Fig. III), the distribution of bullets will be another such as the distribution in our coin-tossing polygon. As the number of partitions increases, our polygon approaches a curve—the normal curve—whose equation is $y=Ae^{-Bx^2}$. A and B are constants for a particular rifleman and a particular number of bullets fired; A is the height of the curve; B is a constant that depends upon the accuracy of the rifleman. The area enclosed by the curve and the axis of abscissas represents the number of bullets fired. Figure IV shows the distribution of the same number of shots of a good marksman and of a poor marksman.

We may get a suggestion of the nature of the resemblance between this curve and our coin-tossing polygon by imagining a very mechanical rifleman who has succeeded in aiming his gun exactly at the center, but during the instant while he was pulling the trigger a succession of slight impulses, each equally likely to throw his gun to the right as to the left, has spoiled his aim. If we imagine that the gun is actually fired at the end of the fifth impulse we have a case exactly similar to our tossing of five coins; the probability of five successive impulses to the right is small just as the probability of a run of five heads is small; the probability of three impulses to the right and two to the left is the same as the probability of

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three heads and two tails. If our rifleman had had a tendency to fire to the right rather than to the left, that is, if with our mechanical rifleman the impulses to the right had been more likely to occur than the impulses to the left we should have in the latter case a top-spinning polygon which in the actual case would approach a curve closely connected with the normal curve.

So far we have been speaking of cases in which some theoretical expression could be found for the law of probability, but there are thousands of cases where the presence of a law is evident but a deeper insight seems impossible. For instance, if we plot as abscissas the heights of men in the University and as ordinates the number of men or, better, the ratios of the number of men having these respective heights we shall have a polygon with considerable uneveness, to be sure, but nevertheless evidently approaching some curve as a limit, and as the number of men that are measured increases the polygon becomes more regular, just as the polygon representing some actual distribution of heads in the tossing of five coins becomes more regular as we increase the number of trials. Now the fact that we have before us a curve is a most significant thing. It shows us at once that behind what seems the fortuitous distribution of height there is a law, for a curve is the picture of a law. Now further, it is a fact—not to have been predicted beforehand—that this curve is very much like our normal curve. That we must interpret to mean that the impulses that tend to make a man differ from the most common height are of the same general character as the impulses that tend to spoil a rifleman's aim; that is to say, as likely to cause a less height as a greater height.

Such a curve as this is called a variation-curve or a curve of frequency. A great number of anthropometric and zoölogical data yield frequency-curves of very nearly the normal type. One who has begun to study such frequency-curves is led to plotting statistics of the most curious kinds, and the curves that result show that there

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are laws underlying them all. For instance, the following all yield curves: barometric heights—barometric heights as abscissas, frequency of corresponding heights as ordinates (Fig. V); ages of women marrying men of a given age—for instance, from some large mass of marriage statistics which are easily to be had, pick out the marriages in which the husband is twenty-five years old; there will be a few wives of fourteen and fifteen, then a rapid increase to a maximum at perhaps twenty years, and then a gradual descent—men of twenty-five marry women of thirty, forty, fifty years, but less often as the age increases beyond the maximum at perhaps twenty; number of divorces in terms of duration of marriage—the abscissas give number of years of marriage, the ordinates the number of divorces for the corresponding length of married life (Fig. VI); mortality—the abscissas are ages, the ordinate for a given abscissa is the number that die at that given age (Fig. VII); mortality from enteric fever in terms of age (Fig. VIII); the petals of buttercups—the abscissas are the numbers of petals, the ordinate the frequency (Fig. IX); the value of houses—the abscissas are the values of houses, the ordinates the frequency of houses of the corresponding value (Fig. X); and so on through all the range of statistics.

The curves above are none of them true normal curves—the first two, barometric heights and age of women at marriage, closely resemble the skew top-spinning polygons, but the others are of still different type. We may generalize our coin-tossing and top-spinning in this way. Suppose a bag contains ten black balls and ten red balls. If you draw five balls, one at a time, each time replacing the ball, you have stood an equal chance each time of drawing a black or a red, and the law of probability of the various combinations is the same as for the tossing of coins. If, however, there are ten red and twenty black balls and the ball has been replaced each time, the odds are two to one for a black, and the law of probability is the same as for our top-spinning. But if the ball has not been replaced

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each time the probability at each trial changes and we have a new law of probability.

Now, just as there are certain mathematical resemblances between the coin-tossing and top-spinning polygons and the normal curves and their skew relatives, so the equations can be written of a class of curves which have a certain resemblance to this new class of polygons. These new curves are of several types.

Now, you must understand that we can give no *a priori* reason why the tabulation of statistics should give frequency-curves of this kind; our reasoning has been merely that since we have observed that certain classes of statistics are representable by normal curves and their skew relatives, which are closely connected with our coin-tossing and top-spinning polygons, it may be that certain other classes of statistics will be representable by the curves connected with the *generalization* of our top-spinning and coin-tossing. The inference, if so, would be that while with certain classes of statistics representable by the normal curve (where the probability of variation in either direction is equal) or by the skew-curve (where a variation in one direction is more likely than a variation in the other), while in these cases, I say, the small impulses that determine a variation are independent of each other—that corresponds to putting the ball back again—in the latter cases these small determining impulses influence each other —that corresponds to not putting the ball back again. However that may be, it is certainly true that these new curves represent very well many new kinds of statistics.

The curves that concern us are the normal curve and the skew curve, for the great mass of biological statistics give either normal curves or slightly skew variations. Since we shall use these curves so much we must make a few definitions and observations. By *organ* we shall mean any measurable characteristic; in this sense we are measuring an *organ* when we measure stature, or length of arm, or the the thickness of a hair, or count the number of

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petals. The *material* of which we are measuring an organ may consist of individuals—we may be measuring the stature of a lot of schoolboys; or it may consist of undifferentiated parts of the same individual—we may measure the thickness of the hairs on one head, or we may count the veins in the leaves of one tree. The whole area between the frequency-curve and the axis of abscissas represents the material to which the statistics have reference. This is more evident if our curves are thought of as generated in a somewhat different way; instead of plotting the number of men having a height between 5 ft. 8½ in. and 5 ft. 9½ in. as an ordinate at 5 ft. 9 in., let us make equal to this number the area of a rectangle standing on this one-inch base. Such rectangles indicate a curve, and it is evident not only that the whole area bounded by this curve represents the whole material under observation, but that the area between any two ordinates represents the material having an organ in size between the values of the two corresponding abscissas. This area divided by the whole area will give the probability that an individual taken at random will have an organ of a size between these limits.

The size of organ that is most common—the abscissa corresponding to the maximum ordinate—we shall call the *mode*, the fashionable size. The *average* size of organ—given by the position of the center of gravity of the area between the curve and the abscissa-axis—we shall call the *mean;* the size of organ that is as likely as not to be exceeded—given by the ordinate which divides the whole area into two equal parts—we shall call the *median*. In the normal-curve these three are all one. The difference between the mode and the mean may be taken to measure the skewness of a curve. Further, we need a measure of the concentration of the curve—the organ may vary between narrow or between wide limits. Such a measure may be the radius of gyration of the curve-area as it is swung about its center of gravity—*i.e.*, the distance of the point at which the mass of a thin plate of the same size and shape as the

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curve area might be concentrated without changing the energy of gyration. This distance is called the standard deviation. For the normal curve in the language of the theory of errors it is the error of mean square. These definitions apply to any curve. In the normal curve, however, the curve is known as soon as the mean and standard deviation are given.

Now I want to emphasize still further the importance and significance of this curve of variation. Suppose we make measurements upon some organ in a great number of individuals of the same species. We shall obtain a frequency-curve whose mode and standard deviation show us at once the type of the species and its tendency to variation. This is what I want to say and to emphasize: this frequency-curve completely characterizes the species—with respect to this particular organ. If you should pick out some other large number of individuals from the same species you would get essentially the same curve. This frequency-curve *is* the species for this organ. If a species had twenty important characteristics, we should need twenty of these variation curves to describe it. The particularly simple case of two characteristics can be given a still more complete graphical representation. By representing, for instance, height by abscissas and length of arm by ordinates we may represent an individual with any combination of height and length of arm by a point in the plane. If now at each such point we raise a perpendicular of length equal to the number of individuals with this combination, we shall have a curved surface. This is the frequency-surface for the two organs. It tells us more than the two frequency-curves tell us. Sections of this surface by planes normal to the abscissa-axis and to the ordinate-axis would give, respectively, frequency-curves for length of arm for a given height and for height for a given length of arm. If we lived in space of twenty-one dimensions we might use twenty of them to locate points which should represent individuals having definite combinations of these

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characteristics and the twenty-first to represent at each point the number of individuals having that particular combination. Since no such geometrical representation is possible and since even for a combination of two characteristics curves are so much more easily handled than surfaces, the frequency-*curve* is the basis for our work.

Now then, we start with these assumptions: In biological measurements our variation-curves will be normal or only slightly skew, provided the material we are measuring is homogeneous. This is, however, only a relative term and if we admit that homogeneity and normal curves are associated we may invert our statement and use it as a criterion for homogeneity. Suppose, for instance, we obtain a frequency-curve of this kind (Fig. XI). The inference would be that we have been measuring individuals that group themselves about two distinct types and that this curve is really the sum of two separate normal curves—that is, we have here either two species or two varieties. Here we have a suggestion of an exact criterion for species and varieties. Two groups of individuals should then be characterized as varieties or separate species according as their modes fall short of or exceed a certain standard divergence. But of course it will not do to determine the status of a group by an examination of the frequency-curve for only one organ.

A frequency-curve with two modes would result if the height of men and women in the University should be plotted together. The frequency-curves for the number of petals of flowers are often curious; such a curve may, for example, have separate modes, say of five, seven, nine, thirteen petals, showing that the species has several subtypes.

Practical use has been made of frequency-curves for the definition of groups. In England measurements of this kind have been made upon schools of fish to determine whether there is migration. It would be quite useless to try to discover whether a certain fish came from one school

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or another, for in both schools there are fish exactly alike, but one school may have a curve with mode and standard deviation quite different from those of another. The English experiments showed, I believe, that the variation-curves for a certain fish were different for different points along the coast, but were the same at any one point at different times. That would seem to show that there was no migration.

Rather interesting examples of compound curves are sometimes gotten by plotting frequency-curves for the examination-marks of classes; plot, for instance, at 95 an ordinate of length equal to the number that received marks between 90 and 100, etc. The curve will very often have two distinct modes, showing that the class consists of two different types of students. There may be at least suggestions of still other modes. A system of classification of students into sections if it is not to be artificial should be based upon the examination of such a frequency-curve. A justification for a four-section classification would be such a curve as that of Fig. XII.

An interesting example of the resolution of a curve into component curves is Karl Pearson's resolution of the mortality curve. The curve is given in Fig. VII. You see that it means that out of say a thousand babies born, a great many die in the first few years of life; the mortality at thirteen and fourteen reaches a minimum; there is a gradual rise to a maximum at about seventy and then a falling off, indicating the few that are still living after that age. This is the curve that all life-insurance theory and rates are based upon. Pearson set himself to work to find whether it was possible to resolve this very complicated curve into constituents of our simpler types. One cannot help wondering whether there can be any *unique* resolution. Pearson believes there is: he found—by mathematical analysis of the curve—the only satisfactory resolution to be the following: first, a very nearly normal curve (very evidently the curve of old age,—you notice a few die of old age

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at twenty-five and thirty); second, a middle-age curve with its mode about forty (this has not been interpreted); third, a low normal curve of young manhood (this has not been interpreted, unless it be due to the recklessness and love of danger characteristic of that age); fourth, a curve neither normal nor skew-normal, but of one of the types associated with our generalized drawing of balls, is almost exactly the curve that gives the mortality from scarlet fever and diphtheria (that of course suggests its interpretation); lastly, a very interesting curve that undoubtedly represents the deaths due to causes that had their origin in heredity or at least in events preceding birth. Pearson says he could not find a curve to represent this part of the mortality-curve until he let it extend back beyond birth; when we come to think of it that is what we should expect from the continuity of nature; curiously enough he found this part of the curve led him back over almost the exact length of antenatal life; this part of the curve agrees fairly well with statistics such as there are.

We have seen how a gunner's shots follow a normal distribution; it was natural then to personify the causes behind these five curves by gunners with varying precision and skewness of aim; Pearson found an artist who carried out for him this idea in the spirit of those weird mediaeval conceptions, the dances of Death, and the result is a very interesting picture, a symbolism as striking as Holbein's, and deeper because of its scientific import. The picture is the frontispiece in the first volume of some essays by Pearson called The Chances of Death and other Studies in Evolution.

I may speak here of a curious observation that Pearson makes about the curve giving the age of women that marry men of twenty-five. He found a skew-curve that fitted it fairly well up to thirty or thirty-five years, but from there on the curve ran higher than the statistics; he says that can indicate only that the women did not tell the truth about their ages. A similar case occurred during the civil

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war: the curve giving the ages of men that enlisted was high out of all proportion at the age of enlistment.

Now we are only just ready to begin with the application of these ideas to the study of organic evolution, but just here I am embarassed by this very wealth of possible application, and I wish you to take what follows as merely a suggestion of what has been done and what may be done as fuller data come to be examined in this new light. Pearson's work has appeared for the most part in the Philosophical Transactions; the last edition of his Grammar of Science has an excellent short account of the subject. There is a general bibliography and other interesting matter, in a handbook called Statistical Methods, by Davenport of Harvard.

The factors of organic evolution are variation, selection, and heredity. We must study these quantitatively. You realize that our frequency-curve has already given us a picture of the variation within a species; but we must go further. If the organ that we had been measuring had been, for example, the number of veins on the leaf of a certain species of tree, we should have obtained a certain curve as usual. Now suppose we choose the leaves all from one tree; we shall obtain again a frequency-curve, not for the species but for this particular tree, and it will for this organ represent the tree in the same way that our first curve represented the species. The two curves in general will differ both in mode, showing the tree has a certain individual type, and in variability: the variability will be less than the variability of the species,—as we should expect; that is, the leaves from one tree look more alike than a lot of leaves taken from many trees and in general have a peculiar type. Let us study this from another point of view. Let us, for instance, study the resemblance between two flowers growing on the same stalk—sister-flowers, we may call them. Now we do not accomplish anything if we attempt to formulate the resemblance between an individual flower and its sister-flower any more than we accomplish something when we attempt to make a general formulation of

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the resemblance between father and son by an observation of father and son taking the cases individually. We must take all the fathers together and all the sons together and study the resemblances of the average son to the average father, or better, we must study the frequency-curve for sons for a given organ in connection with the frequency-curve for fathers, or better still, we may plot a frequency-surface for the complex of sons and fathers. In our case, instead of father and son, we have sister-flowers. Let us then choose several thousand pairs of sister-flowers. The accompanying table I have copied from

No. of Stigmatic Bands on Fifth Capsule.

	5	6	7	8	9	10	11	12	13	14	15	16	Totals	Means
5	.....	8	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	12	6.33
6	8	38	46	26	11	5	2	.....	.....	.....	.....	.....	133	7.11
7	4	46	184	163	146	78	31	8	1	.....	.....	.....	661	8.22
8	.....	26	163	380	366	279	111	75	23	4	.....	.....	1475	9.06
9	.....	11	146	366	554	415	250	161	68	9	5	.....	2017	9.51
10	.....	5	78	279	415	514	520	340	113	27	10	.....	2300	10.12
11	.....	2	31	111	250	520	770	506	190	52	9	.....	2371	10.78
12	.....	.....	8	75	161	340	506	353	178	35	12	.....	1527	10.96
13	.....	.....	1	23	68	113	190	178	93	23	11	.....	677	11.19
14	.....	.....	.....	4	9	27	52	35	23	26	13	.....	190	11.82
15	.....	.....	.....	.....	5	10	9	13	11	13	4	.....	65	13.05
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	12	133	661	1475	2017	2300	2371	1527	677	190	65		11,038	10.04

No. of Stigmatic Bands on Second Capsule.

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the Grammar of Science. Pearson found that the number of dark stigmatic bands on the capsule of the wild poppy was a characteristic easily observed and yielding a nearly normal curve. The table is made up of data from 5,513 pairs of sister-poppies. The table was made in this way: The capsules having, for instance, eleven stigmatic bands were selected; there were found to be 2,271 of such; the sister-capsules of these were then examined; these did not in general have eleven bands; only 770 of them had eleven bands, 366 had twelve, 160 had thirteen, etc. In fact these 2,271 sister-capsules of capsules with eleven bands form what is called an array and give a nearly normal frequency-curve by themselves. If we erected at each number in the table a perpendicular proportional in length to that number we should obtain a surface; the sections either way would be the nearly normal frequency-curves of the different arrays. We still have not come to the interesting point about this table, or this surface, if you like. Take the array of sister-capsules of capsules with seven bands; you notice that the mean is 8.22, that is, the sister of a capsule with seven bands has on the average 8.22 bands; similarly the sister of a capsule with eight bands has on the average 9.06; with nine bands, 9.51; with ten bands, 10.12; with eleven bands, 10.73; with twelve bands, 10.96; etc. You will see this more clearly from Figure XIII, where simply the means of the different arrays are plotted. You notice that for only one case is the mean for an array the same as the number belonging to the array; that is, the array of sister-capsules of capsules with ten bands, whose mean is nearly ten, 10.12; you notice that 10.04 is the mean of all the capsules. In all the other arrays there is a *regression* of the mean toward the general mean. You notice that these mean values nearly form a straight line. The slope of this line is taken as the measure of correlation. When the angle is 45° the correlation is perfect; there is no regression toward the general mean. If the angle is 0° there is no correlation; there is no more resemblance between sisters than between non-sisters.

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This is only one of many instances of correlation. When we proposed to form a frequency-surface for length of arm and height, we had at our disposal data that would have shown correlation. We should have found a regression of the modes of our arrays—both for height for a given length of arm and conversely—along a straight line. Do you see that by this means when all the organs of a species have been correlated with each other we are able to determine for, say a given bone, the most probable values of the other organs and thus in a sense reconstruct the being to whom the bone belonged—Cuvier's suggestion?

Our first example of correlation suggests an interesting question. Suppose we determine the measures of correlation for pairs of undifferentiated like organs among all kinds of life; *e.g.*, choose 10,000 pairs of leaves, each leaf of a pair from the same tree; choose 10,000 pairs of hairs, each hair of a pair from the same head; etc. Determine the measure of correlation, and behold, it seems to be nearly constant, between .4 and .5; that is, the tendency for undifferentiated like organs to resemble each other is nearly the same all through nature. Pearson calls this a law of growth and compares it as to its being fundamental with the law of gravitation—it expresses the innate tendency of nature toward variation.

Another fact of growth is made clearer by correlation. Let us use Pearson's example. Plot as abcissas the height of boys at 11 years, as ordinates the heights of the same boys at 13 years. A boy who was 53 inches tall at 11 years and 55 inches tall at 13 years will be represented by a certain point of the plane. Erect at each such point a perpendicular of length equal to the number of boys having this combination of heights at 11 and 13 years. We shall have a surface; the sections of it by planes normal to the abscissa-axis will give arrays of heights of boys at 13 who were all the same height at 11; *i.e.*, boys do not all have the same rate of growth and therefore boys who were together in height at 11 will not be together at 13. We are

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evidently here catching glimpses of very important laws of growth—perhaps of another fundamental law of growth.

Let us now use our graphical methods to discover the action of natural selection. The curve of an adolescent population will change, merely by the law of growth, even though the population be screened from natural selection. Now suppose natural selection to have acted, that is, in the struggle for life certain members of the population have been unfitted to survive, and have died; the curve will have changed still further, probably both in mode and standard deviation. Now the population may be so well adapted to its environment that this change will be simply repeated in each generation. This we shall call periodic natural selection. Periodic selection acts during growth, but produces the same adult generation each time. This is doubtless the type of natural selection that operates for the most part upon populations well established in stable environments. But this periodic natural selection may be accompanied by a permanent change of type; at each generation our curve may be changing its mode and variability; this change we say measures the effect of secular natural selection. The environment is no longer most favorable to the old mode; natural selection has acted to move the species toward a more favorable mode. The presence of natural selection evidently implies a relation between the death-rate and some organ; but the determination of this relation is made very difficult by the correlation among the different organs; natural selection may not be acting directly upon a certain organ, but indirectly through the correlation between this organ and some other organ upon which it is acting directly. Furthermore, natural selection may act directly upon several correlated organs at the same time,—one can easily imagine the resulting complication.

One of the chief demands we make upon organic evolution is for an explanation of the origin of species. Let us try to imagine the origin of a new species. Let us suppose

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that migration has taken place, and that part of a species is under a new environment. The type best fitted to survive in the new environment will undoubtedly differ from the corresponding type in the old environment; secular natural selection will therefore operate to produce a new type, and, after a few generations, the two parts of the species may have very different curves. Or, it may be that without migration a sudden change in the environment has started natural selection to developing perhaps not simply one new type, but several. The question still remains—how to provide for the integrity of the new types? Here several factors may enter. For one thing, if we can show that the individuals of one class prefer to mate with each other, rather than with those of another class, we shall have a bar that will tend to keep the two parts from uniting. We are to inquire, therefore, whether like tends to mate with like; that is, we must see whether there is any correlation between mates. Pearson has made correlation-tables for husband and wife, and finds that there is a closer correlation with respect to height between husband and wife than there is between uncle and niece; and that there is a closer correlation with respect to eye-color between husband and wife, than that between first cousins. This we may call assortative mating. Its measure for a given organ is the correlation for mates.

A factor that will certainly be of importance in this connection is what we may call preferential mating; mating is preferential with respect to an organ when the frequency-curves for the mated and unmated parts of a population are different. A certain small number of data that Pearson had at hand seemed to indicate that marriage was more common among people with light eyes than among a general population.

Another important differentiating factor is differential fertility; fertility is differential if it is correlated with other characteristics. Instead of directly examining the correlation, we may more easily form a frequency-curve with respect to a given organ, for instance, first for wives

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and then for mothers, and notice whether the curves differ. There is the same old difficulty in not knowing whether the correlation is direct or indirect. Pearson's data seem to indicate that in women fertility is correlated with height; in men, with darkness of eyes. It is evident that unless this reproductive selection is exactly balanced by natural selection it will tend to change the race-type until it becomes the type of greatest fertility, *e. g.*, daughters will grow taller,—as, indeed, they are believed to be doing.

We have spoken of the graphical way of discussing and measuring variation and selection; it remains to discuss heredity. Our first example of correlation developed a law of growth according to which like parts in an individual will obey a definite law of variation. This should hold true of the male and female gametes. The chance combinations of variable gametes will therefore lead to individuals obeying some definite law of variation. We therefore see that variability of the offspring is a consequence of variability of like parts in the individual. Heredity, however, is only, as it were, the obverse of variability, and so is also a corollary of variation in like parts. Thus, variation in the like parts of an individual and its corollaries, heredity and variation in the offspring, are seen to be fundamental organic laws. The measure of heredity is evidently the correlation between parents and offspring.

I hope this very inadequate account of this new method of attacking problems in the growth of organisms may nevertheless in a measure suggest its possibilities and how it will be able to give answers to very important questions that can be gotten in no other way; it is a method, however, as you readily see, that involves immense labor in the collection and treatment of the large bodies of data that it requires.

I would emphasize further that this method of examining statistics does not require that the curves be normal; the normal curve is merely the simplest form of frequency-curve, fortunately the most common, and its treatment is correspondingly simple.

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CURRENT NOTES.

The thirty-fourth annual session of the California Teachers' Association was held in San Francisco December 26, 27, 28, and 29, 1900. Among the papers read were the following by members of the Faculties of the University of California;—before the Council of Education: Accrediting Systems—Universities, by Professor Slate; Legislation touching School Hygiene, by Professor Dresslar; Course of Study for High Schools, Mr. Heaton; The Past—Forecast of the Future, by Professor Brown;—before the Department of Classical and Modern Languages: Homeric Hiatus, Professor Clapp; Some Suggestions to Teachers of German, Professor Putzker; Medical Inspection of Schools, by Professor von Adelung;—before the California Association of Teachers of History: The Decline of Greece, by Dr. Ferguson;—before the Department of Child Study: The Function and the Scope of Foreign Languages in Secondary Schools, by Professor Richardson; The Function and the Scope of Science in Secondary Schools, by Professor Slate;—before the Department of Nature Study: Experiments in Plant Study, by Dr. Osterhout;—before the Department of High School Science: Laboratory Work in Botany, by Dr. Osterhout; The Importance of the Quiz on Text, Lecture, and Laboratory Work, by Professor Slate.

At the second annual session of the Philological Association of the Pacific Coast, held in the Mark Hopkins Institute of Art, San Francisco, December 28 and 29, the

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following papers by members of the Faculties of the University of California were read: University Ideals, and The Legality of the Laws of Sound, or the Causes of Uniformity in the Phonetic Change, by President Wheeler; Grammatical Notes on Pindar—The Accusative Case, by Professor Clapp; Chinese Literature, by Professor Fryer; Fresh Light on Facts and Dates in the Life of Robert Greene, by Professor Gayley; Educare, Educere, and Educate, by Professor Merrill; Greek Elements in Schiller's Poems, by Professor Putzker; On the Form of Horace's Lesser Asclepiads, by Assistant Professor Richardson; and The History of the Contrary to Fact Construction in Latin, by Dr. Nutting.

The three-foot reflecting telescope presented to the Lick Observatory in 1895 by Edward Crossley, F.R.A.S., of Halifax, England, has recently been used in the production of stellar and nebular photographs. Of ten of these that were received by him, Professor H. C. Vogel, Director of of the Astrophysical Observatory at Potsdam, Germany, writes: "These photographs are in every respect the finest that have yet been made in the field of astronomy."

The following articles by members of the Faculties have recently appeared: Recent Progress in Geology, by Prof. Lawson, in the *International Monthly;* A Sketch of the Life of Daniel Cady Eaton, and Critical Notes on the New England Species of Laminaria, by Prof. Setchell, in the *Fern Bulletin;* A New Determination of the Minimum Visible and its Bearing on Localization and Binocular Depth (a paper read at the International Congress of Psychologists at Paris in August), by Prof. Stratton, in the *Psychological Review;* The First American College of Commerce, in the State University of California, by Prof. Page, in the *New York Commercial;* One Aspect of Vice, by Dr. Moore, in the *American Journal of Sociology;* Filar-Micrometer Observations of Asteroids, by Dr. Townley, in *Astronomische Nachrichten;* and An Application of the Group Theory to

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Hydrodynamics, a deprint from the Transactions of the American Mathematical Society, by Dr. Wilczynski.

Years ago the general assembling of the whole University in the old Assembly Hall in North Hall on Wednesday afternoons to listen to lectures by distinguished visitors to the University was a feature of Berkeley life. The rapid growth of the University led to its abandonment, for there was no lecture-room large enough to hold even a single class. The enlargement and improvement of the Gymnasium has made it possible to re-establish the custom, and on Friday, October 12, the students were assembled to listen to an address by President Jordan of Leland Stanford Junior University on the importance to that University of the passage of the amendment affecting it to be voted on at the approaching election. On October 26, Dr. G. F. W. Holls, Secretary of the American Embassy at the Peace Conference at the Hague in 1899, gave an account of the work of that conference, and Father James Huntington, Superior of the Order of the Holy Cross, of the Protestant Episcopal Church, spoke on The Meaning of Good Will. Two weeks later, Dr. Kellogg greeted the students on his return from his trip around the world, and Professor Louis Dyer addressed them on Machiavelli and Modern Instances. On November 23, Regent Alden Anderson, Speaker of the Assembly, spoke on Arbitration, and President Wheeler on the University as a democracy. The last meeting of the term was on December 7, when Regent Chester Rowell was the speaker.

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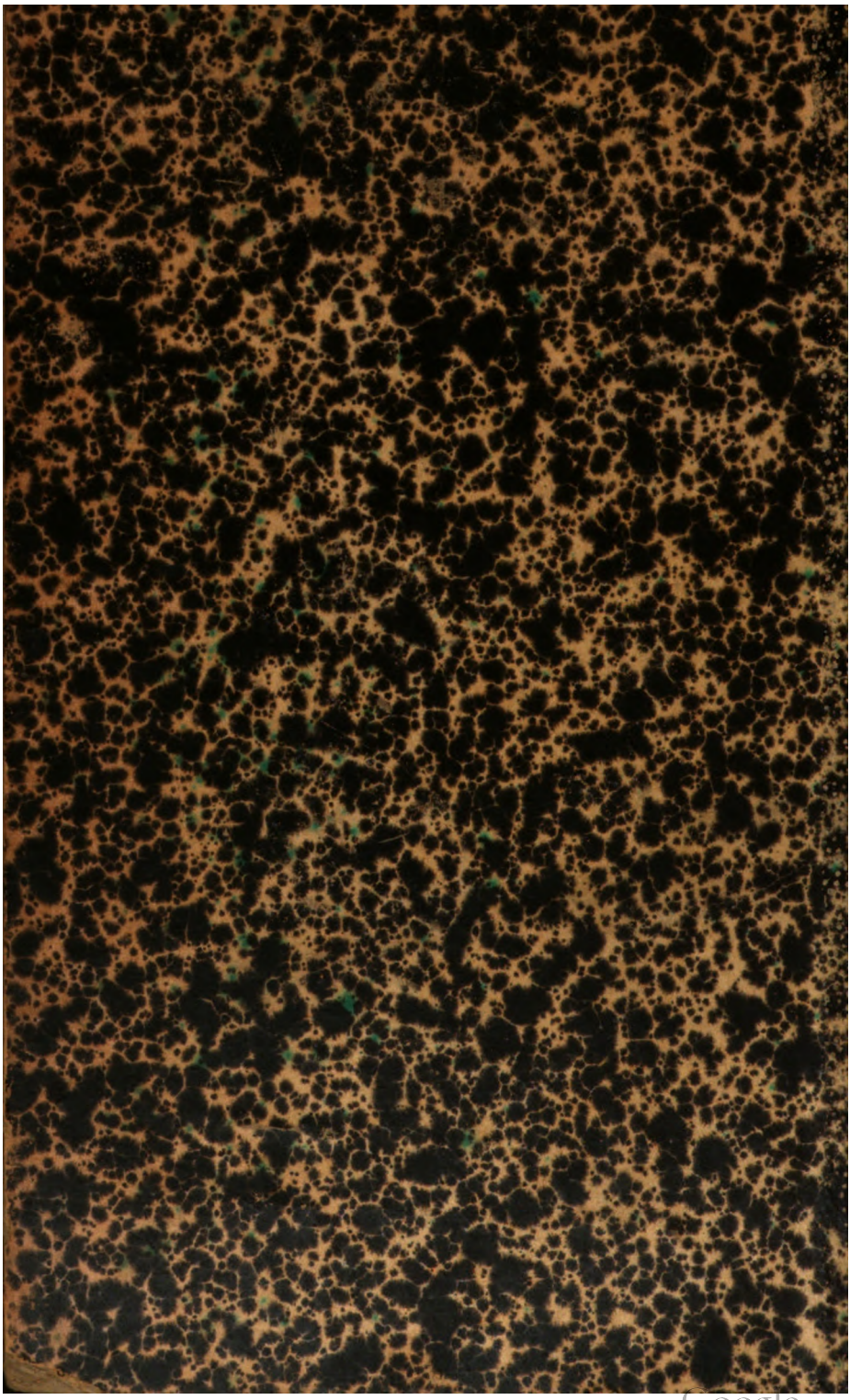
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